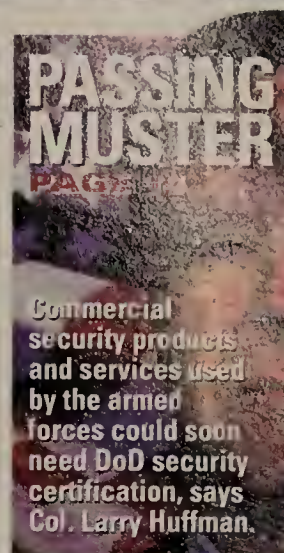


The leader in network knowledge

NetworkWorld



Commercial security products and services used by the armed forces could soon need DoD security certification, says Col. Larry Huffman.

May 14, 2001 Volume 18, Number 20

The network portal: www.nwfusion.com

LIGHT UP YOUR CAREER

Is your career path leading you away from routing tables and toward the negotiating table and the boardroom table? Then we've got a two-year nontechnical training plan for you.

PAGE 43

Big Blue to trumpet Web services scheme

BY KATHLEEN OHLSON

NEWYORK — IBM this week will outline an ambitious plan to help customers build and use a new breed of Web-based application services that the company says will go a long way toward advancing e-business.

The company's Dynamic E-Business strategy centers around exploiting IBM's top

software brands — WebSphere, DB2, Tivoli and Lotus — to support so-called Web services, a term also embraced by IBM competitors such as Microsoft and Sun. In a nutshell, Web services make it possible to build applications that pull together information from multiple sources, whether internal or out on the Web.

IBM's Web services push will

be embodied in new and enhanced products spanning its software lines and will ensure that its software adheres to emerging Internet standards that are key to supporting Web services.

Web services would allow business-to-business to live up to its potential, which is truly collaborative communication

See **IBM**, page 68

NETWORLD+INTEROP

2001

Gig Ethernet services blossom

Offerings move beyond metropolitan networks.

BY MICHAEL MARTIN AND DENISE PAPPALARDO

LAS VEGAS — After making major strides as a metropolitan-area network technology over the past year, Gigabit Ethernet last week got a huge boost as a long-haul alternative.

Three carriers — Broadwing, Qwest Communications and XO Communications — aired plans for Gigabit Ethernet services that will let cus-

tomers connect geographically dispersed offices at speeds of up to 1G bit/sec.

While the carriers were vague on pricing, they said customers would pay roughly 10% to 20% less for the new services than for comparable offerings, such as T-1 and T-3 lines or private-line OC services.

One of the main benefits of metropolitan-area and long-haul Ethernet connections is

See **Giga**, page 69

More Interop news inside.

- ♦ **VPNs coming of age.** Page 14
 - ♦ **Cisco, HP and Nortel push 10 Gigabit Ethernet envelope.** Page 16
 - ♦ **Our Reporter's Notebook looks at the lighter side of the show.** Page 16
 - ♦ **Vendors packing a big punch into new dense servers.** Page 18
 - ♦ **Broadwing prepping VoIP service.** Page 18
 - ♦ **Network Appliance launches management tools.** Page 19
 - ♦ **HP takes aim at Cisco with low-cost switch.** Page 19
- Online
- ♦ **Visit www.nwfusion.com, DocFinder: 4256, for all of last week's show news and Webcasts.**

Back-to-basics theme permeates show floor

BY NETWORK WORLD STAFF

LAS VEGAS — While NetWorld+Interop has always been a showcase for cutting-edge network technologies, last week's event focused more on technologies for cutting IT costs.

Sure, optical Ethernet, voice over IP and other glitzy new offerings got a chance to shine. But many of the show's 800 exhibitors emphasized network management and other more familiar tools aimed at helping companies squeeze more out of their network investments — a message that many attendees welcomed.

"I'm just making do most of the time," said Lance Ray,

network/systems infrastructure manager at service provider XO Communications. Ray, who saw his \$2.5 million network management budget get slashed this year, was examining new technology from management software vendor RiverSoft, which sells a product called Fault Manager that XO uses to manage its network with minimal staff.

"We don't have the luxury to just keep buying and not get all that we can from our existing software anymore," said Kim Kloskey, a senior data network engineer with Aurora Health Care, which is taking another look at Aprisma management software it had sitting on its shelves. "It's more like 'Try

See **Interop**, page 69



What's your pleasure?

OPERATING SYSTEMS:

IF YOU CAN'T DECIDE, THEN DON'T.

MAKING DECISIONS is never easy. In fact, sometimes it's downright confusing. Take operating systems. Nowadays everyone is talking about the beauty of open standards platforms like Linux.® But you're not ready to abandon the proven mission-critical reliability of UNIX.® It's a real dilemma. You want all the familiar assurance of UNIX now, but you may want to try some Linux apps later.

Good news. Introducing IBM AIX® 5L, the new release of IBM's industry-leading UNIX. As ever, AIX is a proven infrastructure mainstay, running on the world's fastest UNIX Web server, the IBM @server pSeries.¹ With the arrival of AIX 5L, the AIX family now also runs Linux-based

applications — so an application that runs on Linux can also run on AIX 5L. And interoperate smoothly across mixed IT environments.

What does it mean? It means a trusted, proven infrastructure platform that now delivers the flexibility of the standards of the future. The best of both worlds.

As integrated e-business evolves more and more rapidly, the best infrastructure decisions you can make are the ones that don't limit your ability to make more good choices down the road. New AIX 5L is one of those decisions.

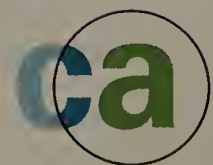
To find out how to bring the flexibility and reliability of AIX 5L to your infrastructure, visit **ibm.com/AIX5L**





OUR SECURITY SOFTWARE PROTECTS , , AND .

We'd tell you who some of our major clients are, but they might have us killed. Suffice it to say, they're people for whom secrecy is paramount. And they wouldn't settle for anything but the best security software. That's why they turn to us. But they're not the only ones. Many of the largest companies on Earth depend on us for their authentication, authorization, and administration security. That's how we got to be the world's largest eBusiness security software provider. Every day, our software protects millions of users, including billions of dollars in wire transfers. And we've been in the business for 25 years. The way we see it, if you don't have the best security, you don't really have any.



Computer Associates™

HELLO TOMORROW | WE ARE COMPUTER ASSOCIATES | THE SOFTWARE THAT MANAGES eBUSINESS™ ca.com

©2001 Computer Associates International, Inc. (CAI). All trademarks, trade names, service marks, and logos referenced herein belong to their respective companies.

NetworkWorld

MAY 14, 2001

- 8 **Microsoft** forcing issue of updating software.
- 10 **U.S. military** plans mandatory cyberdefense.
- 10 **EMC** bolsters SAN scalability with new switches.
- 12 **HP, Accenture** to take on **IBM Global Services**.
- 12 Survey shows **venture capital** going down, down.
- 13 **CRM** software vendors fight for market share.
- 14 **Virtual private network** market coming of age.
- 14 **Doom and gloom?** Not from these guys.
- 16 Vendors take **Ethernet** to the next level.
- 16 Vendors pack punch into **small servers**.
- 18 **Reporter's Notebook**: The lighter side of NetWorld+Interop 2001.
- 18 **Broadwing** readies VoIP services for business users.

**NETWORLD
+INTEROP**



DoD gets tough on network security.

Page **10**

Infrastructure

- 19 **HP** offerings could replace **Cisco** wares.
- 19 **Network Appliance** improves server mgmt. packages.
- 22 **Kevin Tolly**: Guaranteeing your network can handle VoIP.

Net.Worker

- 23 Remote managers brace for **Bluetooth**.
- 23 **High-speed cable service** remains largely residential.
- 24 **Toni Kistner**: Send in the rogues.

Carriers & ISPs

- 27 **Time Warner Telecom** preps Gigabit Ethernet.
- 27 **Equant** airs all-in-one **VPN service**.
- 28 **Lisa Pierce**: Contracts should focus on total revenue.

The Edge

- 29 **WaveSmith** unveils switches.
- 29 **Cisco** to release **IPv6 features** throughout product line.
- 30 Newcomer **PacketLight** pushes metropolitan switches.

Enterprise Applications

- 33 **Privacy tool** due from PricewaterhouseCoopers, Watchfire.
- 33 **Radiant** twisting directory story around database.
- 34 **Scott Bradner**: Bell-izing the Internet?

Technology Update

- 35 **Open-call model** helps bridge ATM-IP.
- 38 **Gearhead**: Spying on the flip side.

Management

- 51 **The road to CCIE**: Book learning takes a backseat to hands-on knowledge.



The lighter side of N+I.

Page **18**



Time Warner Telecom bets on DWDM.

Page **27**



Reaching the peak of Cisco certification.

Page **51**

TELEWORKING TOP 10

What you need to know about home office security.

Page 47

PART 3

STREAMING VIDEO



Telestream's FlipFactory Publish is an effective tool for creating corporate multimedia presentations.

Page 49

Editorial: Searching for network excellence. **Page 40.**

Todd Brooks: The trend toward outsourcing communications services. **Page 41.**

Mary Petrosky: IPv6: This is your wake-up call. **Page 41.**

Backspin: It was Outlook's fault. **Page 70.**

'Net Buzz: The wild and wacky from NetWorld+Interop in Vegas. **Page 70.**

Net Know-It-All.....	Page 8
Ask Dr. Intranet.....	Page 35
Message Queue	Page 40
Editorial and advertiser indexes.....	Page 67

CONTACT US Network World, 118 Turnpike Road, Southborough, MA 01772; **Phone**: (508) 460-3333; **Fax**: (508) 490-6438; **E-mail**: nwnews@nww.com;

CIRCULATION: Phone: (508) 490-6444; **Fax**: (508) 490-6400; **E-mail**: nwcirc@nww.com; **STAFF**: See the masthead on page 18 for more contact information. **REPRINTS**: (717) 399-1900

A customer gets through to you. So, now what?



It's an important moment. How many times a day does this happen? Hundreds? Thousands? Make the most of every one with Customer Relationship Management solutions from Avaya. And make customers for life. Here's how. Unique predictive inquiry routing helps anticipate each customer's needs. And puts them through to the person in your company who can help them best. So whether they're clicking, or calling, or e-mailing, or whatever, their needs are met. Their questions are answered. Their problems solved. Treat people better than they ever thought possible. With Avaya. Call 866-GO-AVAYA or visit avaya.com/solutions/crm

Communication without boundaries

AVAYA
communication

THIS WEEK
ONLINE

NetworkWorldFusion

www.nwfusion.com

USER EXCELLENCE

Cutting-edge networking

Done something really cool and exciting with your network this year? Nominate your network (or a peer's) for *Network World's* annual User Excellence Award. Entries are due by June 11. **DocFinder: 4240**

FORUMS

RF stun guns?

A story last week on easy-to-make radio-frequency devices for disabling PCs prompted a discussion on alternative uses for such things — and the suitability of even discussing them. **DocFinder: 4241**

Gigabit Ethernet slowing down workstations

A user says he recently upgraded a cluster of Windows 95 and NT clients to Gigabit Ethernet and that the end users now complain it takes them longer to log on to their NT domain. Ideas? **DocFinder: 4242**

Network design software

User seeks advice on the best software for diagramming a LAN. **DocFinder: 4243**

RESEARCH

Peer-to-peer

Help *Network World* get a sense of where enterprise network professionals stand on the issue of peer-to-peer networking by filling out a brief online questionnaire. Is it a must-have technology for the 21st Century? **DocFinder: 4244**

Net Know-It-All: Congratulations!

Congratulations to John Donan (aka "Wolfie") from Tustin, Calif. He's April's Net Know-It-All winner. Who will be the winner in May? Play Net Know-It-All every week to increase your chances of winning. **DocFinder: 4245**

LAN leaders answer to you

Register for State of the LAN: The 21st Century Network and learn about cutting-edge technologies and design strategies directly from leaders who are shaping the future of the LAN. **DocFinder: 4246**



CARUSO'S CACHE

The best of the Netflash daily newsletter

N+I roundup

Last week we had NetWorld+Interop 2001, source of much news and many vendor tchotchkes. Why, if it weren't for the annual network show, I doubt I would have enough yo-yos or Slinkies, or a brain made out of foam (other than the one in my head, of course). N+I is why I never have to buy a pen. But if you find news more interesting than trinkets, Network World Fusion is the place for you, with a page devoted to N+I news. **DocFinder: 4256**

EMC improves SAN scalability, availability

For those of you building storage-area networks, EMC used Interop to announce some Fibre Channel network and storage products. The offerings include a 64-port switch, for organizations that aren't fooling around with this. **DocFinder: 4257**

Nortel launches into optical Ethernet

The LAN world of Ethernet is colliding with the optical world of the carriers, leading to a new category of network some refer to as "optical Ethernet." Nortel Networks at N+I gave a glimpse of a module for its Passport 8600 routing switch, a module that will run 10 Gigabit Ethernet using wide-area technology. **DocFinder: 4250**

FCC chief proposes competition crackdown

As you know, real competition in the carrier market hasn't been at the level that it could. Federal Communications Commission Chairman Michael Powell is proposing that the government ensure that competition exists — by raising the fines associated with not competing. **DocFinder: 4251**

— Jeff Caruso, managing editor, online news

Sign up for this e-mail newsletter online. **DocFinder: 3850**

COLUMNISTS

Keeping Current

Broadband Catch 22

Columnist Fred McClimans says EarthLink's new satellite 'Net service is a great idea — just too expensive for mere mortals. **DocFinder: 4247**



Compendium

Fuzzy beach ball

Fusion Executive Editor Adam Gaffin gives us his take on what the Internet nodes and their connections look like. **DocFinder: 4248**



Home Base

Ready for business

Net.Worker columnist Jeff Zbar gives us the secrets of a successful CEO whose company employs full-time — albeit remote — workers. **DocFinder: 4249**

What is DocFinder?

We've made it easy to access articles and resources online. Simply enter the four-digit DocFinder number in the search box on the home page, and you'll jump directly to the requested information.

NEWS BRIEFS, MAY 14, 2001

Shake up at Nortel

Nortel Networks has announced major management changes as it confirmed it is closing down its DSL business worldwide. Nortel CEO John Roth plans to retire next April, and the company will immediately start searching for a new CEO, according to a statement. Meanwhile, COO Clarence Chandran is resigning, effective immediately. He had been on leave since March to recuperate from wounds suffered in a June 1997 attack in Singapore. Chandran also resigned his seat on Nortel's board.



One of Nortel's management changes includes the retirement of CEO John Roth next April.

Current DSL customers will still get support "under warranty," the company said, but they will not be able to buy any more DSL products from Nortel. Nortel was barely making a dent in the DSL market with its IMAS product line, having attained only a 6.3% share of the \$3.2 billion market in DSL access concentrators in 2000, according to Dell'Oro Group.

Pilot surfaces only to sink

Managed security provider Pilot Network Services has officially filed for bankruptcy protection. The Alameda, Calif., ISP, which offered managed security services to several hundred businesses for six years, failed to offer any explanation — even on its Web site — during the last two weeks after abruptly firing all of its 200 employees and failing to notify customers, who were left scrambling to find new services. But last week, Pilot posted a notice at www.pilot.net that said, "We're done. Pilot is no more. This company is an EX-secure ISP. If it weren't for being nailed to the perch, it would fall over." In the "news" section of the Web site, Pilot stated: "Pilot Network Services has filed for bankruptcy," noting site support would be terminated at 5 p.m. May 9. The Web site listed several former Pilot employees said to be available "on a time and material basis" to assist customers. Pilot also listed an attorney to call for information.

The flogging of Exodus

It's been tough going at Exodus recently. Last month, the company reported a cash net loss of \$118 million and said it would cut capital expenditures by \$300 million for the year. A week later, the company's CFO stepped down, as did the COO and chief marketing officer. Then, on May 4, someone infiltrated the outer layer of a security-related Web site that serves as the entry point for Exodus customers checking their firewall process logs. Exodus offi-

cials say no customer information was viewed and they had a suspect in the hands of the FBI by last week. But, as if that weren't enough, last week Exodus' Sunnyvale, Calif., Internet data center failed to roll over to back-up power supplies when a Pacific Gas & Electric power source was disrupted. The Sunnyvale data center is a facility that Exodus received when it acquired Global-Center earlier this year. Yahoo, one of many businesses affected by the outage, said its instant messenger, chat and myYahoo sites were down for about three hours. To top off the week, Exodus announced a 15% reduction in staff, meaning about 675 employees will be getting pink slips.

Technology training bill hits House

A bill that would provide an incentive to companies that invest in training programs designed to increase the IT skills of their workers was introduced in the U.S. House of Representatives last week. The Technology Education and Training Act of 2001 provides companies a tax credit to train workers in IT and would help reduce the number of IT jobs that go unfilled, its sponsors say. A Senate version of the bill was introduced in April. The tax credit could be applied against income tax toward the first \$1,500 a business spends to train an individual worker. It would increase to \$2,000 per individual for small business under certain circumstances.

Solaris gets wormy

Thousands of Sun Solaris servers connected to the Internet have been compromised by a recently discovered worm, Carnegie Mellon's CERT Coordination



Center and security Web site Attrition.org said last week. Attrition.org, which monitors Web site defacements, said in a statement that it has received a list with 8,836 IP addresses of systems that were hit by the "sadmind/IIS worm." The worm penetrates servers running Sun's Solaris operating system, taking advantage of a 2-year-old security flaw. The Solaris system is set up to scan the Internet for vulnerable Internet Information Servers and Solaris servers. Software patches from Sun and Microsoft have long been available to fix the problems. However, the slew of defacements shows that not every Web site administrator is diligent in plugging security holes.

Microsoft licensing change may force more upgrades

BY JOHN FONTANA

Microsoft plans to change its licensing model later this year, and it will most likely force companies to keep software versions current or suffer dramatic spikes in upgrade costs.

Microsoft's new model, announced last week, doesn't increase licensing fees, but it could cost corporations money if they don't get their licensing plans in order before October.

"The new licensing will compel users to move to the latest versions of software," says Kurt Schlegel, an analyst with Meta Group. "And enterprises will find that it will make more financial sense to keep everything under software maintenance to stay current."

Observers are questioning who benefits from the new licensing, which goes into effect in October.

"Microsoft says this is in the best interest of the enterprise, but that is a fallacy," says John Kretz, president of Enlightened Point Consulting Group. "There are a lot of people who don't see the value in upgrading from say, Office 97, and that is the attitude Microsoft wants to change."

Customers who upgrade on cycles longer than three years will see higher costs for software, according to Simon Hughes, program manager for worldwide licensing and pricing at Microsoft.

ing at Microsoft. But nearly 80% of users will see costs unchanged or reduced, he says.

The biggest change Microsoft announced last week was the unification of all its upgrade programs under one umbrella called Software Assurance.

Under the program, customers with Open or Select licensing agreements will get rights to all version upgrades. They will pay 29% of the full-license price of desktop software and 25% of the price of server software per user per year. For example, a \$368 Office license would carry a \$107 fee for Software Assurance.

But users will need to get their software current before the October licensing kickoff. Only those using the latest versions of software will be eligible for Software Assurance. The rule also applies to those with Enterprise Agreement licensing, which includes the Software Assurance program.

IT executives who let Enterprise Agreements lapse between Oct. 1 and Jan. 31, 2002 could get whacked with huge payments for new licenses to get into Software Assurance.

"There will be no concept of upgrade pricing anymore," says Al Gillen, an analyst with IDC. "For people who have been sitting on Windows 95 for six years, if they want to upgrade they have to start over with full licensing." Currently, users on older versions of software can buy into one of the upgrade packages being replaced by Software Assurance.

Microsoft won't eliminate perpetual licensing, a cornerstone of Enterprise Agreements, but will add a subscription licensing option. That means users have can use the software for only a set period.

Microsoft also will reduce the cost of renewing Enterprise Agreements, although details haven't been released. ▀

Be a
Net Know-It-All

Answer this and nine additional questions online and you could win \$500! Visit **Network World Fusion** and enter **2349** in the Search box.

This week's question:

Which radio frequency band do 802.11b wireless products operate in?

www.nwfusion.com

**Windows
Networking**

Subscribe to our
free newsletter.
DocFinder: 5434



**YOUR EXISTING
CAT-5 NETWORK.
(WHEN YOU USE
INTEL® PRO GIGABIT
SERVER ADAPTERS.)**

©2001 Intel Corporation. Intel, the Intel logo, and Intel PRO are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. All rights reserved.

Gigabit capability on your current Cat-5 network isn't a pipe dream. With Intel® PRO/1000 T Server Adapters you can increase your bandwidth capacity by a massive ten times. These gigabit adapters work with your existing 10/100Mbps network and will seamlessly ramp up to 1000Mbps. And they're not just super-fast. They're super-flexible. Intel PRO/1000 T Server Adapters offer advanced server features like load balancing and fault tolerance across multiple operating systems. Intel® PRO Network Connections, the intelligent way to connect. For more information and a trial kit, visit intel.com/network/go/cat5/

intel.

U.S. military plans mandatory cyberdefense

BY ELLEN MESSMER

ARLINGTON, VA. — The Pentagon wants to mandate application and network security services for the military, and later this summer plans to issue guidelines that the Army, Navy, Air Force and Marines will need to follow to protect Web-based resources from cyberattacks.

The Defense Department recently told military brass that computer network defense will be mandatory. It will propose guidelines on use of fire-wall, intrusion-detection and antivirus technologies that it

wants deployed across its sprawling global networks that include three million users at 1,500 locations. The mandate means commercial security products and managed security service providers will have to pass muster by undergoing security certification by the Defense Department. Such certification could force enterprise-class security vendors to improve their wares and could help ease companies' fears about outsourcing sensitive security duties to service providers.

"We want to issue these criteria in the next two months and then institute a process for accrediting commercial or government entities for computer network defense," says Col. Larry Huffman, commander at the Defense Information Systems Agency's Global Network Operations Security Center, which works with Carnegie Mellon's CERT Coordination Center to assess network threats that could affect national security. CERT, which is funded primarily by the Defense Department, provides security alerts related to denial of service, computer viruses and software vulnerabilities.

The Pentagon is working with CERT to define these security requirements. However,

some providers of managed security services are concerned about CERT's extremely influential role in shaping national cyberdefense.

"They're an academic-based organization and not very hands-on," says Paul Robertson, director of risk assessment at TruSecure of Reston, Va., which offers managed security services and security equipment testing. CERT is "good at incident response and collecting information, but hands-on security stuff is outside their purview."

OneSecure, which offers managed security services based on integrating Check Point, NetScreen and Cisco products for fire-wall and intrusion-detection management at its Sunnyvale, Calif., data center, isn't eager to line up for Defense Department inspection.

"I'm not sure CERT is good at intrusion-detection technologies," says Nir Zuk, OneSecure's CTO, though he adds that the OneSecure staff were all trained in incident response at CERT.

"We're not sure the Defense Department always knows what's best or what's the best idea," says Zuk, formerly a research engineer with Check Point and once a software director in the Israeli military. "It depends on what their rules are. When the Defense Department issues their guidelines, we will take a look at them."

From the Pentagon's point

of view, there's a growing need to see security measures deployed uniformly by trusted parties. Earlier this year the Defense Department said it was developing a policy that would mandate use of intrusion-detection systems in all military networks (www.nwfusion.com, DocFinder: 4262).

Potential cyberthreats — such as the week-long Chinese hacker campaign earlier this month to try to break into U.S. government Web sites — has the Pentagon worried.

During the China hacker campaign, the military "saw two million probes and scans from a China source," Huffman says.

The expected massive denial-of-service attack from

The Defense Department's networks at a glance

According to the Defense Information Systems Agency, Defense Department networks are constantly under attack, with 16,000 security events reported through April of this year. The networks consist of:

- 1,500 military bases and stations with about 10,000 LANs.
- 120,000 telecommunications circuits in over 100 countries.
- Over 2.5 million users on the Defense Department's IP-based router NIPRNet backbone, with 70% of traffic going to and from the Internet.
- 13 gateway points to access the Internet.

China never materialized — although the White House Web site was blitzed for a few hours by a strong denial-of-service attack from an unknown source. Given the fact that these attacks can occur any-

time from anywhere, the Defense Department thinks the time has come to mandate uniform security requirements across the services. "We must have mandates to ensure security," Huffman says. ■



DISA's Col. Huffman says the Defense Department plans to issue network security guidelines for the military that will affect the types of managed security services the department will buy.

EMC targets SAN scalability, availability

BY DENI CONNOR

LAS VEGAS — EMC last week announced Fibre Channel switches and storage products at NetWorld+Interop 2001 that market watchers say will make it easier for network managers to deploy distributed and highly available storage-area networks.

The company introduced three Fibre Channel switches: an enterprise-sized 64-port switch; a 32-port switch and a 16-port workgroup switch — and software that lets network managers bridge geographically separated SANs for increased availability and disaster recovery using IP.

The Connectrix ED-64M director is an enterprise-class full-fabric switch that can be used to consolidate servers and storage devices; the Connectrix DS-32M is designed for midsized SANs and departments within corporations; the Connectrix DS-16M is a workgroup switch.

The new switches have twice the port density and take up half the floor space of previous EMC switches. They are designed for companies where space is at a premium.

EMC also announced it is able to transport data over IP between geographically distant SANs, with its Symmetrix Remote Data Facility (SRDF) Fibre Channel over IP software and hardware. SRDF is data-replication software. SRDF Fibre Channel over IP is suitable for Web content distribution, data center migration, application development and storage load balancing. EMC says the software eliminates the need to have multiple copies of an application, reduces the amount of trained staff needed at a site and increases user productivity.

SRDF Fibre Channel over IP is implemented with CNT's UltraNet Director product. In a typical configuration, an EMC Symmetrix would copy data to another Symmetrix via an UltraNet Director on either side of an IP link.

SRDF/Data Mobility uses Adaptive Copy mode to transfer data between multiple Symmetrix arrays using public or private networks. It moves storage data originating from any server platform or operating system, locally within a SAN or remotely through a WAN. In Adaptive Copy, data is

transferred from the source Symmetrix to the remote Symmetrix without waiting for an acknowledgement for each packet of data sent, thus increasing the data transfer rate.

"In the SAN world, movement of data between different locations is a fact of life," says Randy Kern, an analyst with the Evaluator Group. "It's done all the time. EMC has just made it easier. You would use it to move data to other locations for data mining and data warehousing."

Gartner says the replication market is set to more than double from \$1.2 billion today to \$2.8 billion by 2004.

The ED-64M costs \$350,000; the 32-port DS-32M is priced at \$65,000; and the DS-16M costs \$33,000.

SRDF-DM starts at \$66,000, and includes two licenses and two boxes from CNT. SRDF Fibre Channel over IP starts at \$66,000. ■

Correction

The story "Verio, Exodus beef up respective security services," (May 7, page 39) incorrectly cited the partner with Exodus. It should have been Aventail.

Storage

Subscribe to our free newsletter.
DocFinder: 5434



Discover a New World of Network Solutions

Discover a new world of multi-technology solutions for interconnecting servers, desktops and manufacturing floor devices to support traditional business and web-based applications.

DNmultilayer™ 1000 Family

Range of wire speed Campus and MAN Backbone connectivity solutions.

- > Hot swappable modules and redundant power
- > Supports OC-3, OC48 Sonet, 10/100/1000 Ethernet and L2, L3, L4 switching
- > Less than \$1500 per Gigabit port

DNswitch™ Family

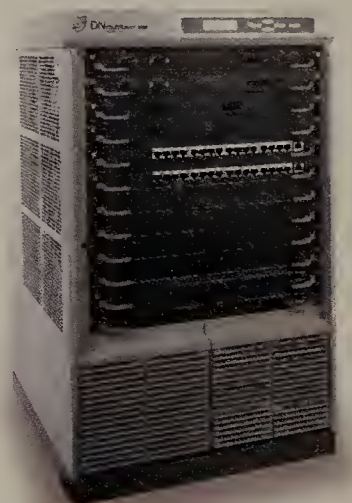
A range of stackable and stand-alone switches ideal for the broadest workgroup environments.

- > High Performance 10/100 and Gigabit Ethernet
- > Free *clearVISN*™ network management tools
- > Low cost of ownership (\$58 per 10/100 port)

DECserver™ Family

Most reliable device server family with more than 1,000,000 units installed worldwide.

- > New DECserver™ 732 model
- > Broad protocol support for retail, manufacturing, office, and building automation applications
- > Proven technology supporting mission-critical environments
- > Less than \$94 per port



Build your enterprise networking solutions with innovative products from Digital Networks.

A vision for the future, a history of innovation and reliability

SAVE \$100 on every purchase

DNswitch™ 248, DNswitch™ 800 and DECserver™ 732

200 Brickstone Square
Andover, MA 01810-1429 USA

US and Canada +1.877.341.9594
Europe +44 (0) 1635.810.432
Others +1.978.474.8300

Digital Networks is the tradename of DNPG, LLC,
and is not affiliated with Compaq Computer Corporation.
DIGITAL, the Digital Logo and DEC are used under license
from Compaq Computer Corporation.



Digital Networks™
digitalnetworks.net

digital

HP, Accenture to take on IBM Global Services

BY JENNIFER MEARS

PALO ALTO — Hewlett-Packard and Accenture, formerly Andersen Consulting, are teaming to provide an outsourcing service that will help firms move legacy applications onto new technology infrastructures, and integrate new technologies with existing systems.

Last week's announcement formalizes the relationship between HP and Accenture, which have been working together for the past three years and have jointly served 15 companies, such as energy services company Halliburton, in launching enterprise resource planning (ERP) systems.

The firms will offer organizations a more integrated service and focus on creating reusable software products that can be deployed quickly and economically, company executives say.

"We're broadening what started out as just a focus on ERP activities to include a much wider range of IT services including complex Web hosting, business model migration... as well as operations and management services," says Ann Livermore, head of HP's service and consulting business unit since March.

With the partnership, the firms are taking direct aim at IBM Global Services, which analysts consider the leader in the growing outsourcing services market. But some analysts question how well HP and Accenture will meld.

"The challenge is you have two different cultures," says Nathaniel Palmer, chief analyst at the Delphi Group. "There's the fundamental problem of rallying two organizations."

HP and Accenture jointly implemented an SAP application for Halliburton that serves more than 11,000 users in 371 sites in 117 countries, says Martin Cole, managing partner of outsourcing for Accenture. ▀

Survey shows venture-funding free fall

BY CAROLYN DUFFY
MARSAN

Venture capital investments in network start-ups are free falling, having plummeted more than 40% to a two-year low of \$7.15 billion in the first quarter, according to a new study.

The quarter-to-quarter decline of \$5 billion raises concerns that the venture capital industry downturn that began a year ago has yet to bottom out. These figures are from a special analysis of a PricewaterhouseCoopers and VentureOne MoneyTree survey conducted exclusively for *Network World* (see www.nwfusion.com, DocFinder: 4291)

All segments of the network industry — business services, software, hardware, broadband, wireless and fiber optics — suffered declines. Altogether, 478 network start-ups received an average of \$14.9 million each in the first three months of this year. In comparison, 751 network start-ups received an average of \$16.4 million each in the previous quarter.

"We're returning to a more normal, historic level of investing," says Tracy Lefteroff, global managing partner of the Venture Capital Practice at PricewaterhouseCoopers. "The first quarter of 2001 is the lowest since the second quarter of 1999."

The first quarter of 2001 was down 64% from the first quarter of 2000, which was the pinnacle of Internet investing. In that record-breaking quarter, \$20 billion was invested in network start-ups.

"Internet investment is dropping rapidly. Even an area that has been extremely hot such as Internet infrastructure had a rough quarter," says Dave Witherow, CEO of VentureOne. "Being Internet-oriented is not a point of differentiation anymore. . . . Venture capitalists are evaluating the businesses as businesses on their own merits."

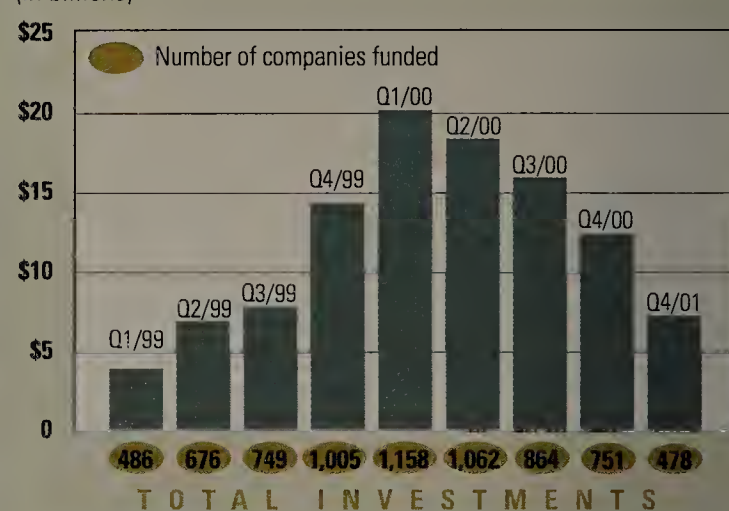
The good news for entrepreneurs is that plenty of capital is available, although fewer deals are being signed. In fact, the 10 largest deals of the quarter all topped \$90 million. These include a whopping \$350 million investment in MetroPCS, a Dallas provider of wireless personal communications services, and \$175 million invested in Telseon, which provides gigabit-speed data services.

"It has not been a very good climate to raise funds," says Robert Ott, CFO at Multiplex, a New Jersey photonic component manufacturer that raised \$105 million from investors led by Credit Suisse First Boston. "This is clearly a great feat that we've pulled off in this unstable market and economy."

VC funding for start-ups plummets

Network-related deals reach lowest level in two years.

(In billions)



SOURCE: PRICEWATERHOUSECOOPERS AND VENTUREONE MONEYTREE SURVEY

10 biggest deals of Q1

Metropolitan-area networks dominate investments.

Company	Location	Deal	Description
MetroPCS	Dallas	\$350M	Wireless personal communications services.
CityNet Telecommunications	Silver Spring, Md.	\$175M	Carrier-class optical networks in metro areas.
Telseon	Englewood, Colo.	\$175M	Gigabit-speed fiber-based data services.
Sigma Networks	San Jose	\$145M	Broadband metro-area networks.
GiantLoop Network	Waltham, Mass.	\$120M	Managed optical network services.
Multiplex	South Plainfield, N.J.	\$110M	Photonic components and subsystems.
Xtera Communications	Allen, Texas	\$110M	Long-haul fiber-optics communications systems.
Looking Glass Networks	Oak Brook, Ill.	\$100M	High-bandwidth, metro-area data services.
PacketVideo	San Diego	\$100M	Software supports video-over-wireless networks.
Knology	West Point, Ga.	\$93.5M	Broadband services in the Southeast.

SOURCE: PRICEWATERHOUSECOOPERS AND VENTURE MONEYTREE SURVEY

Ott attributes Multiplex's financial success to the fact that it is already shipping components and generating revenue. Multiplex will use the additional funds to increase manufacturing capability.

One area still popular with venture firms is high-speed, metropolitan-area networks. An example is IntelliSpace, a New York provider of broadband Internet access to commercial customers.

Founded six years ago, IntelliSpace built a profitable business wiring New York office buildings with high-speed Ethernet technology. Last quarter, IntelliSpace raised \$45 million in cash to expand in 14 additional cities.

"We were as successful as

we were because we've demonstrated our ability to do this in a market," says Jeff Allen, president and CEO of IntelliSpace. "We already have 30,000 business users and 1,700 corporate customers."

Allen expects investors to remain interested in companies that address the last-mile problem with alternatives to DSL and wireless technologies, which are proving too capital-intensive to sustain.

"Companies like us that have a very strong economic model and don't need a long period of time between funding and bringing back positive cash. Those kinds of companies will get funded," Allen predicts.

The survey showed several other trends:

- Fewer investments are being made in early-stage companies, with the number and size of seed and first-round investments dropping by half.

- Equity financing by corporations has fallen off dramatically, representing only a fraction of the amount invested last year.

- More companies are turning to investment bankers rather than venture capital firms to lead later rounds of financing.

This quarter's survey represents a restating of previous quarters to include a broader definition of equity financing that includes private placement equity, corporate investing and certain other private equity in venture-backed companies. ▀

CRM vendors look to ease implementations with integrated packages

BY ANN SULLIVAN

Three customer relationship management vendors are shoring up their software to make it easier for customers to integrate e-commerce activities.

In the past, CRM applications focused on salesforce automation and call center functions, and firms mostly developed their e-commerce channels separately, says Steve Butler, senior analyst at eMarketer. "Today, the name of the game is to integrate all [these functions]."

In the spirit of integration, E.piphany this week will announce Version 5.5 of its Web-based E.5 software that now ties sales activities to marketing and customer service functions. The new sales component, called E.piphany Sales, is based on technology the San Mateo, Calif.,

AMR Research's Johnson says i2 isn't yet a legitimate CRM vendor because its product lacks salesforce automation and contact center capabilities. But the com-

pany has set itself up to compete in the CRM arena, and Johnson says he expects i2 "will make a more credible entrance in the next three to six months through

acquisitions or strategic alliances."

E.piphany: www.epiphany.com; PeopleSoft: www.peoplesoft.com; i2: www.i2.com

CRM facts

- Typical CRM implementations involve 10 to 15 vendors.
- More than half of 33 vendors surveyed recently could not justify a CRM investment because they could not measure customer profitability.

SOURCE: FORRESTER RESEARCH

firm obtained when it acquired Moss Software in a stock-swap deal last month.

E.piphany Sales will let sales personnel access customer information, including real-time analytical data, remotely through a PC, wireless phone or PDA with a Web browser. The package fills a hole in E.piphany's suite, says Rod Johnson, AMR Research service director. Customers can now purchase E.5 components individually or in packages. Packages start at \$250,000.

Meanwhile, PeopleSoft for the past few years has been building its CRM stable — with its January 2000 acquisition of salesforce automation software maker Vantive, for example — and next month will release PeopleSoft 8 CRM. PeopleSoft's retooled CRM suite has a Web-based architecture and includes a customer portal that grabs data from many applications to provide one view of sales, support and billing transactions. Available in June, the cost of PeopleSoft 8 will depend on the implementation.

Another vendor trying to make further inroads into the CRM market is supply chain management vendor i2 Technologies, which last week announced an upgrade to its suite, i2 CRM. With the new release, i2 adds order management and decision support applications for forecasting demand, determining pricing and planning for service needs. I2 declined to disclose pricing for i2 CRM, which is available now.



SECURITY

- Firewall
- VPN
- Anti-Virus
- Content Filtering
- Authentication
- SSL Acceleration



COMPREHENSIVE INTERNET SECURITY

SECURITY MEANS DIFFERENT THINGS TO DIFFERENT PEOPLE

Don't use small-time methods to protect your enterprise network. Hackers can cost you millions of dollars. From high-performance firewalling to scalable VPNs with strong authentication, SonicWALL provides the comprehensive security solutions you need—integrated on a robust hardware platform. We're #1 in worldwide dedicated VPN hardware units installed, and #2 in firewall hardware units installed.* And our solutions are easy to deploy and manage—allowing you to maintain a consistent security policy across your distributed enterprise.

Learn more about our distributed security solutions and get a FREE white paper on "Protecting the Distributed Enterprise" by calling 888-557-6642 or visit www.sonicwall.com/nww2.

* As reported by Infonetics Research—The Network Information Source, "VPN and Firewall Products: Quarterly Worldwide Market Share and Forecasts for 4Q00." PeopleSoft, E.piphany, i2, and SonicWALL are registered trademarks of SonicWALL, Inc. Other product and company names mentioned herein may be trademarks and/or registered trademarks of their respective companies.

Virtual private network market coming of age

BY TIM GREENE

LAS VEGAS — At long last, the VPN market is starting to mature, at least judging from vendor and customer activity last week at NetWorld+Interop 2001.

With more than 30 VPN equipment makers and service providers pushing their wares, conference attendees were trying to decide which gear and services to buy or how to enhance their existing VPNs. They weren't just trying to figure out if they were interested in the technology.

"2000 was the year of VPN education, and 2001 is the year of making it happen," said Nick Frankle, director of product support for Lockheed Martin Global Telecommunications VPN services.

Another attendee, Rick Major

of Utah State College at Logan, said VPN technology has become so accepted that professors and staff at the school requested it by name. "They said they specifically wanted a VPN," the system specialist said.

Those seeking the newest in VPN technologies weren't disappointed last week, as vendors displayed VPN/firewall boxes that can protect sites connected to the Internet with gigabit links, and service providers offered VPN services for the first time or beefed up existing services.

Among those already sold on VPNs is Anthony Browser, a network analyst for the Legislative Data Center, which provides network services for the Cali-

fornia state legislature.

He is gearing up to replace 172 \$600 T-1 lines that now connect legislative offices with a VPN based on \$60-per-month DSL lines. And though the cost

savings will be dramatic, Browser said his organization moved cautiously to VPN technology.

"We wanted to take a year to look at it first. Before we offer a new service we want to make sure it works," he said.

In The Air Data, a Las Vegas service provider, was shopping at the show for VPN gear to support a wireless remote access service for lawyers in the courthouse district of Las Vegas. The company has spent a year researching gear for its network, which it hopes to have up and running this summer.

"You'll still have break-ins with VPNs, but you will with any technology. Hackers are pretty ingenious," said David

Henry, In The Air Data's CTO.

VPN vendors are responding by augmenting their products with intrusion detection and other security. Check Point Software's entire display at N+I was dedicated to its hardware partners — companies that add Check Point's VPN-1/Firewall-1 to their intrusion-detection gear, for instance — and to service providers that manage customers' network security.

Some hardware vendors say alliances with VPN companies are a must. Storage products vendor Nishan is making sure its hardware works with offerings from VPN companies.

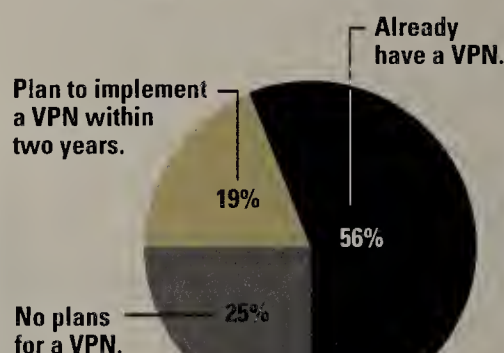
"With storage service providers offering services now, you have equipment at the customer's site, but also at the service provider's [point of presence]," said Prasad Pam-midimukkala, director of software product management. The link between the two must be protected, and VPNs are a viable way to do that, he says.

In other VPN activity at the show, vendors displayed combinations of firewalls and VPN servers that can protect high-speed connections service providers now offer to corporate data centers. SonicWall showed its gigabit-firewall GX device, which performs VPN processing at 260M bit/sec and allows selective protection for the most important traffic. Also, Asita announced load balancing among the separate hardware modules on its 2G bit/sec VPN/firewall chassis.

Beyond new gigabit gear, RedSiren, a managed security provider, announced it is teaming with RedCreek to deliver VPN services with RedCreek's Ravlin VPN gear. FiberLink, which already had a dial-up VPN service called VPNterprise, has added intrusion detection provided by Network Ice's Black Ice software.

Optimism about VPNs stems from users' belief that the technology can save them money, said Henry Goldberg, a senior analyst with Cahners In-Stat Group. In addition, once VPN gear is in place, the time to turn up a new site is a matter of days, whereas getting a frame relay or ATM connection can take a month or more. ■

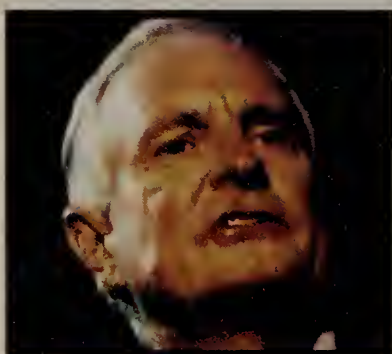
Is there a VPN in your future?
Here's what 253 U.S. organizations with more than 1,000 end users had to say:



SOURCE: CAHNERS IN-STAT GROUP

Fiscal doom and gloom? ... Not from these guys

N+I keynote speakers profess confidence that the woes wreaking havoc on the industry will prove short-lived.



"I've been in the semiconductor industry for about 27 years, and I've been through these slowdowns. The one thing I know for certain is that the pace of technology never slows down. The only thing that slows down is the number of orders and the profit on the bottom line."

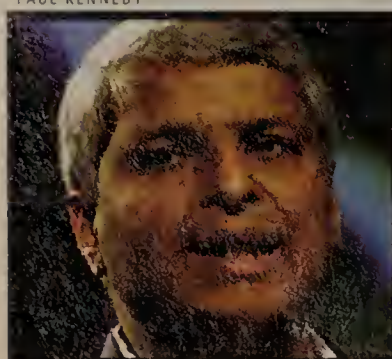
Craig Barrett, CEO, Intel



PAUL KENNEDY

"Is IT a fad? Is the Internet a fad? Or are the basic principles true? Our conjecture is that the basic principles are true. We don't need to change our basic strategies; we need to reevaluate [them] in consideration of the fact that there is a storm."

James Richardson, senior vice president, Cisco



PAUL KENNEDY

"A lot of you are probably wondering what's going on in the telecom business because of the slowdown. I think that's temporary. If you look at optical networking as the next 20-year cycle ... these are just slight [deviations] that we go through."

Guruj Deshpande, chairman, Sycamore Networks

IBM	100%	100%	100%
Microsoft	50%	50%	50%
Oracle	25%	25%	25%
SAP	10%	10%	10%
PeopleSoft	5%	5%	5%
JDE	2%	2%	2%
Siebel	1%	1%	1%
Other	5%	5%	5%



THEY NEEDED SOMETHING PROVEN... SOMETHING INTEGRATED. THE CODERNAUTS NEEDED

WEBSPHERE® *FOR* E-BUSINESS

CHOSEN 2:1 OVER OTHER E-BUSINESS PLATFORMS

Vendors taking Ethernet to the next level

Nortel, Hewlett-Packard and Cisco among those showing off prestandard 10 Gigabit Ethernet wares.

BY PHIL HOCHMUTH

LAS VEGAS — Several vendors last week announced or displayed upcoming products aimed at boosting Ethernet speeds tenfold in enterprise and service provider networks.

Although some of the 10 Gigabit Ethernet products previewed at NetWorld+Interop 2001 are six months to a year away from delivery, they could be used to boost bandwidth across campus backbones and support applications such as storage access over IP.

Nortel Networks announced a single and dual-port 10 Gigabit Ethernet module for its Passport 8600 switch intended primarily for metropolitan-area service provider networks. The module will be available early next year, with pricing to be determined

later this year.

The only vendor to announce pricing for 10 Gigabit so far has been Foundry Networks, with its single-port blade, starting at \$45,000. Nortel officials indicated that this price will likely be the average for most vendors' entry-level products.

Nortel expects such high prices to scare off most enterprise customers.

"If you're a vendor trying to sell 10 Gigabit to an enterprise, and customers see a \$50,000 interface, they're going to think you have rocks in your head," said Phil Edholm, CTO for Nortel's Enterprise Solutions group, comparing 10 Gigabit Ethernet to where Gigabit Ethernet was in 1997 — almost nonexistent in corporations.

Hewlett-Packard is also getting into the 10 Gigabit Ethernet act. The company displayed a 10G bit/sec network

interface card (NIC) for its high-end HP 9000 N-class Unix server. The NIC, which is a year away from release, is being developed for HP by Nortel's optical components group. The card supports optical connections from 300 meters to 40 kilometers.

Target applications include Web servers attached to large optical Internet pipes. The card could also be used in an enterprise data center to attach an HP 9000 to a 10 Gigabit switch that aggregates Gigabit Ethernet uplinks from wiring closets. Very high-speed server-to-server data backup is another possible use.

The new NIC caught the eye of several show attendees, including Glen Dasmalchi, director of engineering at Chelsio Communications, a startup that develops TCP/IP acceleration products. He could see using such a prod-



Nortel has developed a Gigabit Ethernet network interface card for HP 9000 servers.

uct for large Web servers that receive an enormous amount of hits per day.

Also at the show, Cisco displayed its OSR 7600 optical switch outfitted with a single-port, 10 Gigabit module. A Cisco product manager said the blade could be used by metropolitan-area network providers for aggregating Gigabit links to Ethernet WAN subscribers. It could also be used for accessing data from a

storage-area network via IP in a firm. Release of the module is four to six months away, with pricing to be determined at release time, Cisco says.

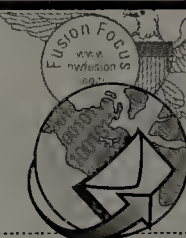
The firm showed a Catalyst 6500 with 10 Gigabit Ethernet technology earlier this year.

One N+I attendee said he anticipated the proliferation of 10 Gigabit, but isn't interested until interoperability is proven among vendors.

"They're still a year away from [ratifying] the standard," for 10 Gigabit Ethernet, said David Brock, an independent network consultant. "I only work with standards-based products." ■

High-Speed LANs

Subscribe to our free newsletter. DocFinder: 5434



Reporter's Notebook

THE LIGHTER SIDE OF NETWORLD + INTEROP 2001

Seen and heard around the convention hall:

Where is everybody?

As with the financial fortunes of so many vendors, attendance was down at NetWorld+Interop 2001. Show officials were circumspect as to how much attendance was off, saying they needed time to get an accurate count. However, they did say that 60,000 had registered, compared to the 65,000 on hand last year. There was a general consensus among exhibitors, attendees — and perhaps most telling, grousing taxicab drivers — that those numbers don't do justice to the actual drop-off.

Steamy story

How hot was it? ... Seemed like Las Vegas in August, that's how hot. Try 100-degrees-plus hot. Hot, hot, hot. But they were ready at the ProactiveNet booth,

where full beach regalia — complete with a volleyball net — was the order of the day. The company makes Web performance management tools, a point that appeared completely lost on the male network professionals watching bikini-clad models play volleyball.



Volleyball was the order of the day at the Proactive Net booth.

SensorX to the rescue

Move over Superman, there's a new action hero in town. At least, there's a new action figure in town. In exchange for a badge swipe and watching a brief presentation, Internet Security System was handing out "SensorX" action figures

(think skateboard dude with super powers) to willing participants. On the back of the package, ISS chronicled the adventures of SensorX and his battle against BL4KH4T, a cyberterrorist. You can follow SensorX's adventures at www.iss.net/sensorx/.

Not so loud and clear

Intel CEO Craig Barrett and his underlings managed a number of daring live-demo feats during Barrett's address but were plagued ceaselessly by that most common of public-speaking bugaboos: balky microphones. So frustrating did the malfunctions become that one Intel presenter threatened to deliver his remarks in sign language.

For his part, Barrett couldn't resist facetiously blaming the troubles on "these Motorola microphones." The actual device manufacturer — presumably not an Intel competitor — escaped unmentioned.

China syndrome

Huawei Technologies, a Chinese maker of telecom equipment, erected one of those sprawling two-story monuments to trade-show excess and had dozens of smartly attired employees standing ready to field

questions from the assembled masses. So much for "if you build it they will come." One was hard-pressed to spot anyone in the complex who wasn't obviously a Huawei worker. A snub over the spy plane and hacker conflicts? Maybe. More likely it's just not a good time for any vendor to be crashing the U.S. market.



Sprint says this contraption will transform telecommuting. See Paul McNamara's 'Net Buzz, Page 70.

Wireless wonders

With wireless this, that and the other thing crammed into every corner of the convention center, it was no surprise that the curious were beating a path to the Wireless Ethernet Compatibility Alliance Pavilion. One indicator of the interest was the ubiquity of the organization's white "Wi-Fi" stickers — with their red blinking lights — that seemed to have landed on an inordinate number of conventioners.

— Paul McNamara and Keith Shaw



IBM

THE CODERNAUTS FIND AN ENVIRONMENT THAT SUPPORTS 35 PLATFORMS. HAIL, OPEN WORLD!

WEBSHERE[®] *FOR* MANKIND

| THE FASTEST GROWING E-BUSINESS PLATFORM ON THE PLANET |

Vendors pack punch into small servers

BY DENI CONNOR

LAS VEGAS — Compaq and newcomer RLX Technologies last week at NetWorld+Interop 2001 became the latest vendors to announce low-power, compact hardware called server blades that are designed for firms looking to pack lots of server power into space-constrained data centers.

Such servers — also dubbed hyperdense — come in the form of single boards one-eighth the size of a typical 1U (1.75-inch-high) server and consume up to 12 times less power.

The servers, which typically start at \$600 to \$1,700, are aimed largely at service providers, but may also meet enterprise network needs, especially once the servers gain load balancing and other management capabilities.

Compaq's QuickBlade, which will ship later this year, will feature an Intel processor with Error Correcting Code memory, two Ethernet adapters and a disk drive. Later versions will use a new low-power Intel chipset called Tualatin. Pricing isn't available.

RLX's System 324, which is shipping and will be resold by IBM, features Transmeta's low-

power Crusoe processor, IBM disk drives and three Ethernet adapters.

The system, which starts at \$1,700 and can be plugged into an RLX chassis that starts at \$2,600, comes preloaded with Windows- or Linux-based Web server software and includes redundant, hot-swappable power supplies. RLX claims its blades can process almost as many Web pages per second as rack-mount servers, based on tests with the high-performance Zeus Web server software. For instance, the RLX System 324, which uses one-fifth the power and is eight times denser than a Compaq 1U DL320 server, was shown to serve up 1,466 pages per second vs. 1,706 for Compaq's machine.

Compaq and RLX join others in the market such as OmniCluster, an IBM spin-out that last month shipped its SlotServer 1000, a 10-watt server blade that runs Windows NT and 2000, Red Hat Linux or BSD. Other companies, such as FibreCycle, eGenera and Amphus, are in the market or will be soon.

Server blades fit into existing PCI slots of other computers or in a rack-mounted chassis. The number of server



Up to 336 RLX server blades fit in a standard rack (bottom). Blades within a rack-mounted chassis are shown above.

blades deployed is constrained only by the number of slots in a CPU or chassis. RLX claims a standard 42U (73.5-inch) rack will hold up to 336 of its blades. Such a rack holds up to

84 typical 1U servers.

Server blades use from 10 to 15 watts of power, as much as 12 times less than 1U servers. For instance, the 1U Sun Cobalt RaQ 4i server consumes 60 watts; the Dell PowerEdge 350 consumes 120 watts.

Donald Becker, CTO for Scyld Computers, was impressed with the RLX servers during a beta test that involved running the Backbone Networks Internet Radio product on a cluster of RLX machines. "The cluster was able to rebroadcast audio streams to tens of thousands of clients," he says.

Server blade vendors are taking density "to the nth degree," says John Humphreys, an analyst at market research firm IDC.

He expects the market for such hardware to surge this year for service providers and later on for companies, which should proceed with caution until solid management tools are available.

"Management becomes a nightmare. How are you going to manage these servers when all of a sudden your data center goes from 2,000 servers to 20,000 servers?" he asks.

RLX: www.rlxtechnologies.com; Compaq: www.compaq.com

Broadwing readies VoIP services for business users

BY DENISE PAPPALARDO

LAS VEGAS — Broadwing is quietly putting together a voice-over-IP service for business users that promises ease of management and cost savings.

The firm has not announced its voice-over-IP plans, but did enter its Business VoIP service in NetWorld+ Interop 2001's Best of Show competition last week. While Broadwing would not comment on the service, *Network World* obtained a copy of the vendor's white paper describing the service.

Broadwing's offering will let business users connect their PBX voice switches to the company's IP backbone. The service will let users send intracompany voice traffic between locations over the same IP connections

they use to connect to the Internet. The idea is to eliminate multiple WAN connections to reduce network management complexity.

Broadwing and its competitors, AT&T and WorldCom — which announced similar voice-over-IP services this year — say such services offer users a reduction in their overall voice service costs by eliminating traditional long-distance charges incurred when sending traffic over the public switched telephone network (PSTN).

It appears Broadwing will offer domestic and international off-network calling capabilities. This will let users make voice-over-IP calls to anyone, not just people in their company.

Although voice-over-IP services are not widely used today,

they are expected to grow. Research firm IDC recently polled 400 WAN managers with 100 to 5,000 employees and found that only 11% of those users say they are using integrated voice and data services. By year-end, 23% of users expect to roll out such services, though 64% still plan to keep voice and data networks separate.

Broadwing will support its service by deploying a customer premises equipment gateway at each user site. The service provider would not comment on which network vendor's gear it will use. But the gateways will support session initiation protocol (SIP) for call setup and Differentiated Services (Diff-Serv) for traffic prioritization, according to the company's white paper. SIP

is used to send and receive voice calls between the PSTN and IP networks.

Broadwing will use Diff-Serv to mark voice packets in an effort to support traffic prioritization.

Broadwing will probably announce its Business VoIP Service by the end of June, but the company would not confirm a time frame. There were no details regarding pricing at press time.

Broadwing: www.broadwing.com

Convergence

Subscribe to our free newsletter.
DocFinder: 5434



NetworkWorld

Editorial Director: John Gallant
Editor in Chief: John Dix

NEWS

Executive Editor, News: Bob Brown
Associate News Editor: Michael Cooney
Associate News Editor: Paul McNamara

INFRASTRUCTURE

Senior Editor: John Fontana,
(303) 377-9057; Fax: (303) 377-9059
Senior Editor: John Cox,
(978) 834-0554; Fax: (978) 834-0558
Senior Editor: Deni Connor,
(512) 345-3850; Fax: (512) 345-3860
Senior Writer: April Jacobs, (603) 742-1789
Staff Writer: Phil Hochmuth

NET.WORKER

Managing Editor: Toni Kistner, (201) 587-0124

CARRIERS & ISPs

Senior Editor: Tim Greene
Senior Editor: Denise Pappalardo,
(202) 879-6745; Fax: (202) 879-6753

THE EDGE

Managing Editor: Jim Duffy
Staff Writer: Terri Gimpelson, (603) 934-6002

ENTERPRISE APPLICATIONS

Senior Editor: Ellen Messmer,
(202) 879-6752; Fax: (202) 879-6753
Senior Editor: Carolyn Duffy Marsan,
(703) 917-8621; Fax: (703) 917-8622
Senior Writer: Jennifer Mears,
(608) 275-6807; Fax: (608) 275-6814
Senior Writer: Kathleen Dhlson
Senior Writer: Ann Sullivan
Staff Writer: Denise Dubie

COPY DESK/LAYOUT

Copy Chief: Ryan Francis
Senior Copy Editor: Ian Lamont
Copy Editors: Brett Cough, John Dooley,
Monica Hamilton

ART

Design Director: Rob Stave
Art Director: Tom Norton
Senior Designer: Michelle Barbera
Senior Designer: Stephen Sauer
Graphic Designer: Lisa Hovsepian
Art Assistant: Amanda McCormack
Infographics Researcher: Jacy Edelman

FEATURES

Features Editor: Neal Weinberg
Managing Editor, Features: Amy Schurr
Features Writer: Sharon Gaudin
Opinions Page Editor: Susan Collins
Features Writer: Suzanne Gaspar

REVIEWS

Test Alliance Director:
Christine Burns, (717) 243-3686
Senior Reviews Editor: Keith Shaw,
(508) 490-6527
Reviews Editor: Mike Avery
Test Alliance Partners: Mark Gibbs, Gibbs & Co.;
Joel Snyder, Opus One; Dennis Williams, ProductReviews.com; John Bass, Centennial Networking Labs; Bob Currier, Duke University; Tore Bracco, Current Analysis; Barry Nance, independent consultant; Thomas Powell, PINT; Edwin Mier, Mier Communications; Thomas Henderson, ExtremeLeads; NTS/XXCAL; Travis Berkley, University of Kansas; David Newman, Network Test; Christine Perrey, Perrey Research & Consulting
Contributing Editors: Daniel Briere, Mark Gibbs, James Kobialus, Mark Miller

NETWORK WORLD FUSION

Executive Editor, Online: Adam Gaffin
Managing Editor: Melissa Shaw
Events Editor: Sandra Gittlen
Managing editor, online news: Jeff Caruso,
(650) 577-2714; Fax: (650) 358-4518
Associate Online News Editor:
Joanne Cummings (978) 688-0109
Multimedia Editor: Jason Meserve
Online Copy Chief: Sheryl Hodge
Online Copy Editor: Greg Cusack
Senior Web Producer: Marlo Matoska
Web Producers: Chris Cormier, Kris Guey,
Katie Ward

Online Researcher: Elaine Valovic

SIGNATURE SERIES

Editor: Beth Schultz,
(773) 283-0213; Fax: (773) 283-0214
Executive Editor: Julie Bort, (970) 468-2864,
Fax: (970) 468-2348
Senior Copy Editor: Ian Lamont
Copy Editor: Brett Cough

Editorial Operations Manager:
Cheryl Crivello
Office Manager, Editorial: Glanice Fasold
Editorial Office Administrator: Pat Josefek
Research Assistant: Deidre Massenberg
Main phone: (508) 460-3333
E-mail: first name_last name@nwn.com



Infrastructure

TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices, Clients, Servers, Operating Systems, VPNs, Networked Storage

Briefs

Storage vendor Vixel unveiled three 2G bit/sec Fibre Channel switches last week that promise to double the speed of current storage-area networks. The 9000 Series Fibre Channel Fabric switches include an eight-port, 16-port and a high-availability model. All operate in full Fibre Channel fabric SANs, support connections of up to 32 other switches and are backward-compatible with existing 1G bit/sec devices. The 9000 Series switches will be available next month starting at \$11,500.

Vixel: www.vixel.com

Novell announced last week at NetWorld+Interop 2001 that it will improve its ZENworks for Desktops software distribution package by adding support for PXE (pronounced "pixie"). PXE is an Intel-defined specification for remote desktop management that lets desktop machines boot from its network adapter without user intervention. Using PXE, customers can determine if a remote machine's disk needs to be imaged or updated without turning the machine on. The PXE feature, code-named FireStarter, runs on Windows 95, 98, NT 4.0, 2000 and Millennium Edition workstations. Existing customers will receive FireStarter for free.

Novell: www.novell.com

Sun last week beefed up its storage appliance family with the Sun StorEdge N8400 and N8600. The appliances are meant to give users storage space while requiring minimal configuration efforts. The N8000 series can store up to 10 terabytes of data in a stand-alone configuration. The new appliances complement the lower-end N8200 released by Sun last year. The N8000 devices are available starting at \$53,800 for about a half-terabyte configuration.

Sun: www.sun.com

HP targets Cisco with low-cost switch

BY PHIL HOCHMUTH

Hewlett-Packard last week at NetWorld+Interop 2001 announced a new modular switch aimed at kicking Layer 2 Cisco boxes out of enterprise wiring closets.

The ProCurve Switch 4108GL is an eight-slot chassis for large to midsize business customers that need to deploy a large number of Layer 2 ports in their wiring closets. HP also announced a new mini-gigabit interface card (mini-GBIC) module for its high-end ProCurve 9300 line of backbone switches and new HP Open View-based management software for controlling HP switches with a Windows NT-based server.

With 10/100M bit/sec ports costing as little as \$135 each, HP says the 4108GL could be an inexpensive replacement for Cisco's Catalyst 4006, which averages about \$216 per Layer 2, Fast Ethernet switch port.

The 4108GL has an array of modules for performing switching tasks, as well as Gigabit Ethernet fiber and copper ports for servers or high-end workstations. Each blade in the chassis acts as a stand-alone switch, able to handle all packet-forwarding tasks. HP says this feature gives the box faster throughput than switches that send packets through the backplane of the switch or to other routing modules in a switch chassis, HP claims. The company calls this its "Fast Path" technology.

"If you could add power to one of these modules individually, they'd be a switch by themselves," says Stan Takata, product manager for HP's workgroup networks division.

The new ProCurve 9300 module is an eight-port mini-GBIC blade that lets cus-

tomers add a bunch of single-mode or multimode fiber connections all at once to a backbone switch. The HP

ProCurve network management for OpenView-NT (OV-NT) is designed

to fill the gap between HP's free net management tool for handling networks of up to 2,000 nodes and its high-end HP OpenView product for handling networks of unlimited size.

The software runs on an NT server and can manage 5,000 nodes.

Modules for the switch include a 24-port 10/100M bit/sec switch module as well as a six-port Gigabit Ethernet module.

The base price for the ProCurve 4108GL chassis is \$5,000. Fast Ethernet and Gigabit Ethernet modules range in

price from \$2,000 to \$14,000. The 4108GL chassis and modules will be available June 1. The mini-GBIC module for the 9300 costs \$9,700, while the OV-NT network management software costs \$3,400.

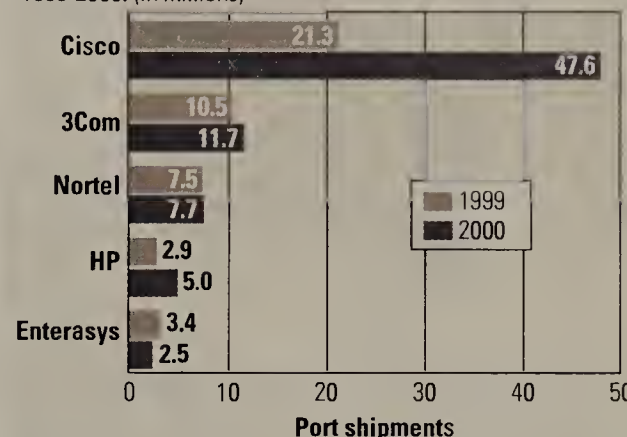
HP: www.hp.com

**NETWORLD
+INTEROP**

HP's switch stake

HP, better known for PCs and servers, has battled in the modular Fast Ethernet switch market.

Worldwide total 10/100M bit/sec switch port shipments, 1999-2000. (In millions)



SOURCE: IDC

Server mgmt. packages to debut

BY DENI CONNOR

LAS VEGAS — Users of Network Appliances file servers and caching systems will be able to manage, monitor and enforce capacity quotas from a single management interface with software the company rolled out last week.

At NetWorld+Interop 2001, Network Appliance announced three software products that let customers monitor file servers and caching devices, maintain quotas on user disk space, and uncorrupt Microsoft Exchange running on Network Appliance file servers if problems exist.

The first software package, Data Fabric Manager, lets customers automatically discover and map the Network Appliance file servers and caching devices on the network using SNMP so they can be monitored and managed. It lets network managers reallocate disk space across the network and will send out alerts to a designated party if it senses trouble, such as a downed power supply. Data Fabric Manager manages local and remote file servers and caching devices. Data Fabric Manager runs on any workstation with a

Web browser.

Software that lets network managers monitor and manage the capacity and utilization of their storage devices is important, says Galen Schreck, an analyst with Forrester Research. "A lot of enterprises see 40 to 50% utilization of storage because of the way they allocate their storage," he says.

Network Appliance also announced SecureShare Quota Manager, a software utility that lets network managers set disk space quotas for their NetApps file servers. SecureShare Quota is based on the Microsoft Management Console and runs on Windows NT- or 2000-based file servers.

Network Appliance file servers compete with EMC's ip4700 NAS system and appliances from Dell, Compaq and Auspex.

Data Fabric Manager is available this month starting at \$19,400 for five managed servers or caching devices. SecureShare Quota Manager will be available next month for less than \$500 per server.

Network Appliance: www.networkappliance.com

www.nwfusion.com

FAST FACTS

Head online for more information about HP's Fast Path technology and get more specs on the ProCurve 4108GL.

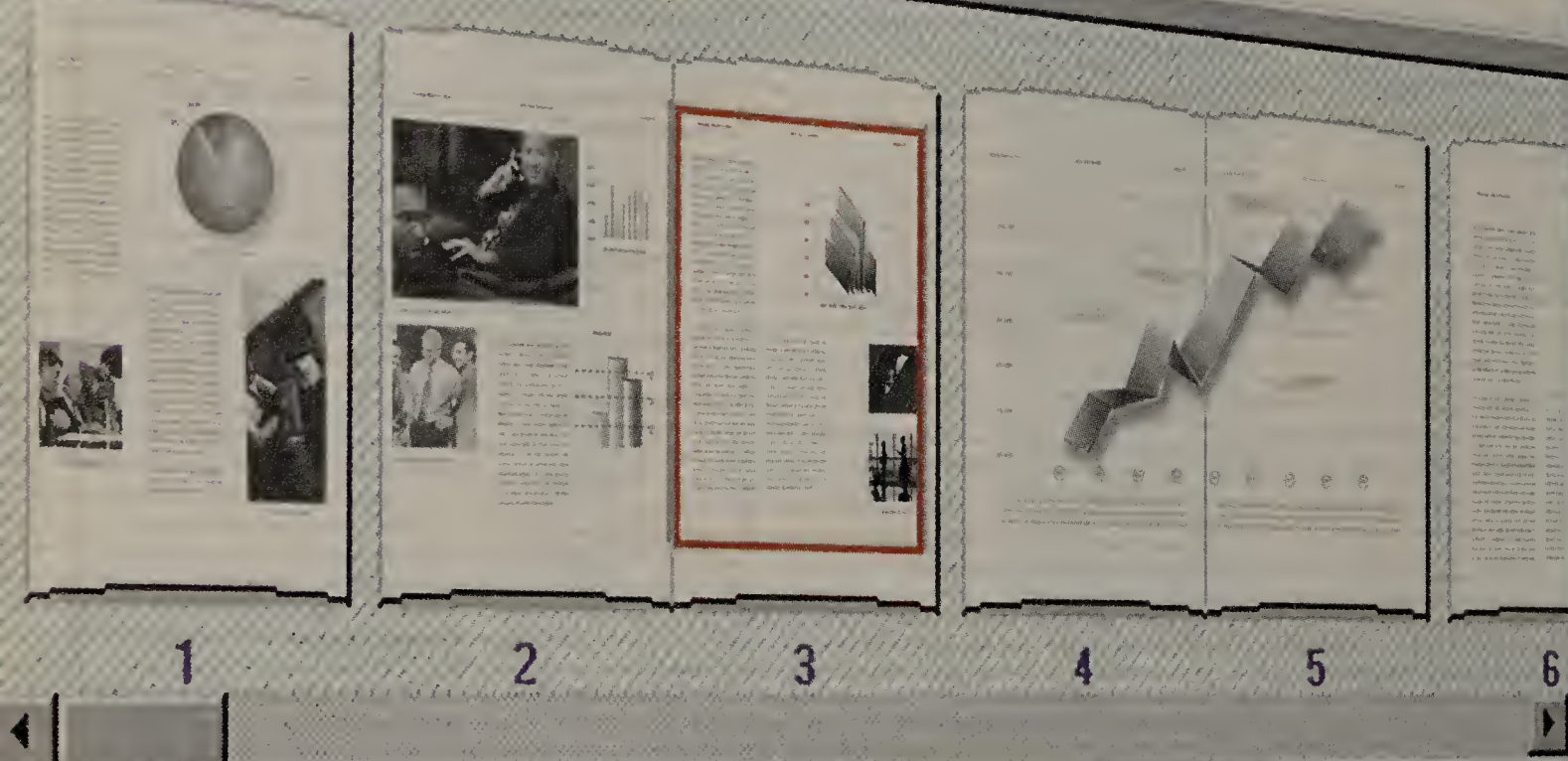
DocFinder
4239
find it online

Canon Page Composer

Document Name:

Destinations Travel Guide.doc

Total Pages : 60



Delete

Print Preview...

Document List

Print Settings

Copies:

999 (1 - 999)

Print Style:

Booklet Printing

☐ Output Size Consistency:

☒ Layout Consistency:

Page Order:

☒ Print next document from:

Letter

1 Page per Sheet

Same side

Details...

Restore Defaults

OK

Cancel

Help

AUTO

EXIT

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

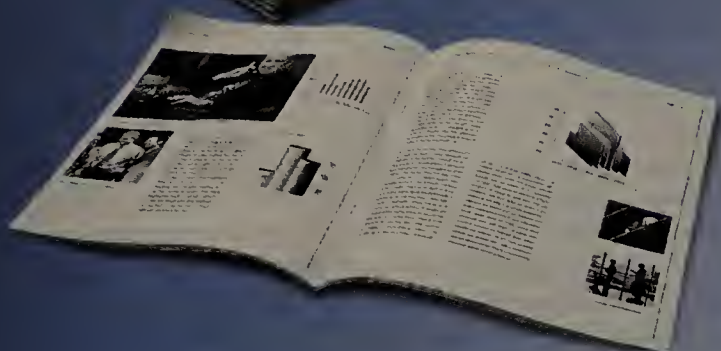


Introducing the Canon imageRUNNER 8500.

Now, all the breakthrough innovation that made the Canon imageRUNNER

unsurpassed in digital imaging is yours at an astounding speed

of 85 ppm. The seamless network fit. The ease of desktop printing.



For fast-moving enterprises, Canon has raised the print-on-demand speed limit to 85 ppm.

The finishing capabilities like stapling, hole punching, z-folding, and document insertion, all achieved with the

click of a mouse. And the renowned Canon reliability. You'll find it all in the imageRUNNER 8500 digital document



production system, and at an operating cost designed to improve

your profitability. At Canon, we're giving people



the know-how to handle heavy workloads with the greatest of ease.

Call 1-800-OK-CANON ext. 8500
or visit www.imagerunner.com

Canon is a registered trademark and
imageRUNNER and Canon Know How are trademarks of Canon Inc.
imageANYWARE is a service mark of Canon U.S.A., Inc.
©2001 Canon U.S.A., Inc.

Canon KNOW HOW™



Tolly on Technology . Kevin Tolly

GUARANTEERING YOUR NETWORK CAN HANDLE VOIP

Judging by the 1,600 users who registered for a recent audiocast I conducted with our test-tool partner, NetIQ, network architects are desperate for hard data about how best to prepare for deployment of voice-over-IP networks.

The reality is that there are no definitive answers when it comes to deployment of voice over IP. There are only choices — lots of choices and lots of trade-offs you must make that have enormous implications for the quality of your voice services and the resources you consume delivering them. (You can listen to the audiocast with PowerPoint slides by visiting www.netiq.com/voipAudiocast/).

Our primary message was the integration of voice over IP forces you to make trade-offs. There's a cost in the bandwidth expended for delivering

the voice stream; a trade-off in the amount of latency you let affect voice quality vs. how efficiently you stuff voice samples into IP packets; and a trade-off in how secure you make your voice-over-IP transport vs. the resource burden that entails.

The traditional method of adopting a new technology such as voice over IP is to purchase voice-over-IP gear and run a pilot; stabilize the technology and then deploy it in production mode. But NetIQ's John Walker says while this tried-and-true approach worked well in data nets, it can't simply be adopted for voice over IP. He says, and I concur, you need to first determine if your data network fundamentally can support voice over IP — that is, have acceptable congestion, latency and jitter characteristics — well before you purchase your first

piece of voice-over-IP gear.

That means going down the checklist of your network infrastructure components and testing them to ensure they support voice by not imposing unreasonable delay, contributing to packet loss or causing jitter.

And you have to test the voice encoder/decoders (vocoder) you intend to use. These are the devices that packetize voice traffic for travel across the IP network. You have to be the judge for what level of vocoder compression is required to deliver the audio quality best suited for your applications. That compression choice, which ultimately determines the base bandwidth of a voice stream, correlates directly to the number of voice-over-IP calls you can support across a given link.

A vocoder that supports the G.711

specification (that transmits voice at an equivalent of 64K bit/sec) doesn't fit 24 voice-over-IP calls into a T-1 line. Assuming two voice samples in each packet and taking IP packet overhead into account, you can fit about 16 calls onto that fat pipe. You can fit more calls onto the link by using vocoders with greater compression ratios, but then you run into latency and packet-loss trade-offs again.

Even if you're just thinking about voice over IP now, the more you know upfront, the better prepared you'll be to address myriad of trade-offs you'll face when it's time to make the move to voice over IP.

Tolly is chairman and CEO of Tolly Research and founder, and president and CEO of The Tolly Group. He can be reached at ktolly@tolly.com.



You've heard about the convergence of data, voice, and video — but what's the best way to evolve your existing network to take advantage of the benefits converged applications deliver?

Find out how to . . .

Unleash the Power of MultiService Networking

. . . a new business imperative that enables you to:

- Plan and implement a customer-ready network
- Maximize performance and minimize cost
- Optimize your LAN environment for enterprise-based VoIP

You're invited to attend this **FREE BREAKFAST** seminar:

MultiService Networking: A New Business Imperative

Featuring Dr. Jim Metzler, Principal, Ashton, Metzler & Associates, who will talk about the evolution, trends, and business drivers of enterprise networking.

AVAYA
communication

Attend Avaya's **FREE** breakfast seminar in a location near you:

Anaheim, CA	Thursday, May 17, 2001
San Diego, CA	Tuesday, May 22, 2001
Houston, TX	Thursday, May 24, 2001
Toronto, ON	Tuesday, May 29, 2001
Chicago, IL	Thursday, May 31, 2001
St. Louis, MO	Tuesday, June 5, 2001
DC Area	Thursday, June 7, 2001
Miami, FL	Thursday, June 21, 2001
New York, NY	Tuesday, June 26, 2001
Boston, MA	Thursday, June 28, 2001
Montreal, PQ	Thursday, July 12, 2001
Calgary, AB	Tuesday, July 24, 2001

How to register:

Space is limited at these complimentary seminars, so be sure to register early.

CALL: 800-692-6325

WEB: www.burlgrp.com/multiservice



Net.Worker

Products, services and strategies for tying teleworkers to the enterprise

Briefs

Some long-awaited partnerships should help spur the adoption of residential gateways into home offices. Verizon announced it would offer Cayman Systems' 3320 H broadband gateway to its DSL customers and through Verizon Enterprise Group, which provides services for the telework programs of McGraw Hill and Dupont. Also EarthLink announced it would offer co-branded versions of 2Wire's HomePortal 100 and 1000 residential gateways and technical support for home nets.

Verizon: www.verizon.com;
EarthLink: www.earthlink.com

Parting hasn't been such sweet sorrow for U.S. Robotics. Since breaking away from parent 3Com last year, U.S. Robotics has resumed a leadership role in the analog modem market, and is making good on last fall's promise to expand into the wireless network and broadband access markets. Just shipped is the U.S. Robotics Broadband Router (\$150), a four-port 10/100 Ethernet device with a built-in print server that lets you share a DSL or cable connection among PCs and Macintosh systems.

U.S. Robotics: www.usr.com

Proxim recently demonstrated home network gear using HomeRF 2.0, the long-anticipated 10M bit/sec standard. The firm says 10M bit/sec Symphony products will ship by September. Although industry support has waned, the HomeRF Working Group contends the technology is superior to its wireless rival, 802.11b — particularly in its voice capability. To that end, Siemens recently demonstrated the first HomeRF voice call — placed from a Siemens cordless handset through a Proxim voice data module gateway to a standard phone line.

Proxim: www.proxim.com;
Siemens: www.siemens.com

Remote managers brace for Bluetooth

BY JOHN COX

During the next year, all kinds of equipment used by remote workers will begin sporting a short-range radio interface called Bluetooth. Get ready for some toothaches.

Bluetooth is starting to emerge in headsets and cell phones and in adapter cards and interfaces for handhelds, desktops, laptops and printers. Research firm Cahners In-Stat, of Scottsdale, Ariz., predicts 100 million Bluetooth products will ship next year, leaping to nearly one billion in 2005. But potential problems abound, including partial security, no standard roaming feature, buggy interoperability and interference with wireless LANs.

Originally conceived as a wireless replacement for cables, Bluetooth now is being touted as a voice and data wireless network, even an alternative to 802.11b wireless LANs. The latter is a controversial claim not only because of Bluetooth's design, but also its 30-foot range, 1M bit/sec throughput, and a limit of seven simultaneous connections. But many IEEE groups are putting the final touches on a set of 802.15 standards defining personal-area networks, the core of which is the Bluetooth specification.

Britain's Red-M offers an example of a Bluetooth net. Its Linux-based 3000AS, a small, \$3,000 device, accepts up to seven Bluetooth connections and forges a wide-area VPN link, using ISDN or DSL, between two locations. It incorporates a Web server and has an administrative program that remote network managers can access from a browser and set up user IDs and access rights. Axis Communications of Sweden offers a similar product.

It seems incredible a wireless link of less than 1M bit/sec would be viable, but for remote sites it could be, compared with 56K bit/sec for fast modems and 144K bit/sec for ISDN links. But initial Bluetooth products will raise potential problems for IT groups.

For one thing, Bluetooth's security is partial, focusing on encrypting data transmissions. The specification supports 128-bit encryption, says Graham Carter, Red-M's product marketing manager. He says, Bluetooth can be configured so users enter a personal identification number to identify themselves, but it's still unclear to what degree that will complicate the

The profile problem

While Bluetooth allows for a range of capabilities (called profiles), not all Bluetooth-enabled devices include all these nine profiles.

Generic access: The foundation for discovering and connecting to another Bluetooth device.

Service directory application: Describes how an application on one device can find and use applications on another.

Serial port: To set up an emulated serial cable connection between two peer devices.

Synchronization: Lets two devices update and merge data such as appointments and phone numbers.

Dial-up networking: Lets a Bluetooth device wirelessly connect to a modem.

LAN access: A Bluetooth "wireless plug" into a LAN interface.

File transfer: Self-explanatory.

Generic object exchange: The basic plumbing to let devices exchange software objects.

Object push: One device can send data objects to another.

users' interaction or slow performance.

Bluetooth also lacks the superior security features basic to 802.11b wireless LANs, says Charles Dittmer, director of communications technology for Compaq's commercial notebook division. "It's not really a wireless LAN."

And Bluetooth currently doesn't support roaming — the ability to keep a connection and a session intact as you move

through a wireless voice or data network. If you move outside your group of eight Bluetooth devices, called a "pico net," your device has to negotiate a new connection. Bluetooth vendors are building roaming features, but none are part of the specification.

Interoperability may also be a problem for some of the first wave of Bluetooth gear. Users may find they can't transfer a file or receive a phone call, perhaps because the manufacturers used different versions of the Bluetooth specification or faulty drivers. Vendors say they're quickly moving to Version 1.1 and say interoperability bugs have been fixed.

But if 802.11b wireless LANs are already deployed in branch offices, there's a chance of interference when Bluetooth devices show up because both radio technologies use the 2.4-GHz band, already crowded by microwave ovens and cordless phones. Vendors also claim when devices using different

technologies are near each other, users of either might see performance slowdown, but no packet loss.

One other issue to watch is the number of Bluetooth "profiles" a device supports. Each profile describes a different Bluetooth use or application, such as file transfer (see graphic). Unless both devices support the file transfer profile, you can't perform that action. ▣

Cable service stays at home

BY MICHAEL MARTIN

The failure of NorthPoint Communications earlier this year left tens of thousands of DSL customers without service and tarnished the reputation of DSL as a business-class technology.

It's somewhat surprising then that DSL's biggest broadband rival — cable modem service — has benefited less from NorthPoint's demise than other DSL providers, such as Covad Communications.

Then again, most cable providers haven't exactly gone out of their way to court business users.

"The cable guys know how to go after consumers," says Adam Guglielmo, an analyst with research consultancy TeleChoice.

"And I see them concentrating on maintaining their lead over DSL in [the residential] market, rather than moving into business services."

A reason cable providers haven't gone after businesses is that unlike DSL, cable is a shared medium; bandwidth and security can become major headaches.

"A lot of the cable providers won't even let you install VPN software on your machine," Guglielmo says. If everyone on a particular cable segment operated over a VPN, bandwidth on the segment could be used up quickly, he adds.

AT&T, one of the largest cable modem providers in the U.S., with 1.28 million See **Cable**, page 24

Platforms for e-Business Leadership

Are you really getting the value your company needs from your business-critical applications? Are those applications true e-business assets?

"To answer 'yes' to these questions about your company's enterprise server architecture, certain requirements must first be met," notes Rodney Sapp, Director of Product Management and Marketing for ClearPath servers at Unisys.

- Underlying hardware architecture must combine powerful processors with main-frame design concepts to deliver the highest value and high levels of modularity.
- The hardware platform must meet rapidly changing business requirements and allow for simultaneous deployment of current processor technologies and operating systems.
- Your enterprise server platform must offer capacity on-demand to meet the unpredictable needs of your e-business without forcing you to pay for over-capacity.
- Your enterprise servers must extend core business applications and still provide enterprise-class levels of reliability, data integrity, scalability and security.

The good news is that you can have all this, and more, as the Unisys ClearPath Plus servers demonstrate.

Get more information at a special interactive Webcast on May 30, 2001 at 10 a.m. EST. To register, visit www.unisys.com/e-biz/webcasts/technology.asp.

UNISYS
We have a head for e-business.

Net Worker



Telework Beat . Toni Kistner

SEND IN THE ROGUES

Despite the industry's best efforts to instill order, proprietary home-network technologies keep cropping up. Standards bodies such as HomePNA, HomeRF, Wi-Fi and HomePlug are formed to quicken time to market of competitively priced and interoperable products — without squabbling over competing standards. Trouble is, protecting the interests of one standard can prevent faster or less-expensive technologies from gaining a foothold.

Take HomePNA, the poster child for vendor cooperation. Despite its legendary quick time to market and competitive prices, the home phone-line market is floundering. And Version 2.0, which promises 20M bit/sec speeds, is nowhere in sight.

Part of the problem has been education, says Patrick Lo, CEO of Netgear, manufacturer of small-office network products for a variety of technologies. Early on, HomePNA refused to spend money on marketing and education, instead expecting the vendors to foot the bill, Lo says. But no one wanted to spend money on an effort that would benefit competitors, so product remained on the shelves misunderstood. My guess is that consumers find it intimidating enough to deal with DSL running over their phone lines, let alone a LAN on top of that.

HomePNA's challenger is an Israeli company called SerCoNet, which says it will begin beta testing its 100M bit/sec home phone-line products by year-end, and will ship product by mid-2002. To achieve such speeds, the technology requires that you replace your existing telephone outlets with SerCoNet's souped-up ones, which support a host of interfaces: 10/100 Ethernet, Universal Serial Bus, IEEE 1394, HomeRF, Bluetooth, and HiperLAN. SerCoNet's home systems will include four outlets and a power supply for about \$200 for the 10M bit/sec version (due out by year-end), and less than \$400 for the 100M bit/sec version, the company says.

Nir Cohen, SerCoNet's business development director, recently returned from a HomePNA meeting in which he tried unsuccessfully to convince the group to adopt his

company's technology. Cohen says the group expressed concern that SerCoNet's technology wouldn't be backward compatible with earlier versions of HomePNA and, perhaps more importantly, that its adoption would prevent the group from getting its return on investment.

Even so, Cohen insists his company is a partner to all standards bodies, not a rival. "We hope to help them increase performance. We have the ability to become the backbone upon which other technologies — wireless and power line — run," he says.

HomePlug has hit a few land mines, too. While the standards body charged with bringing power line network products to market got off to a strong start with the selection of Intellon's technology, industry sources say it's now mired in politics and falling behind schedule.

HomePlug's challenger is nSine, a U.K. silicon manufacturer. Its nPlug technology costs about one-third less than HomePlug-based chips, making it attractive and cost effective for embedding into everything from PCs to refrigerators to stereos.

Vice president of business development Roy MacKenzie says, "PC makers won't embed the products if they aren't cheaper. HomePlug is condemned to being a retrofit product for the short and medium term."

"Our relationship with HomePlug is a complicated one," MacKenzie adds. "We're behind the marketing initiative. But we're not behind the selection of the first-generation technology. We don't think it met the market requirements."

Ironically, nSine didn't set out to compete with HomePlug; the companies' timelines simply converged. When HomePlug was evaluating technologies, nSine wasn't yet ready. Now that HomePlug is behind schedule, it looks like nSine and HomePlug will introduce competing, first-generation chips by the fall.

Kistner is managing editor of the Net Worker section. She can be reached at tkistner@nw.com.

Cable, continued from page 23

customers, is a perfect example.

"We're focused on selling and marketing into residential neighborhoods," says AT&T spokeswoman Sarah Duisik. "But if our plant goes by a business we might be able to connect to them."

AT&T wouldn't offer that business any special services, such as VPN support, Duisik notes. The service would be the same as a residential user would get.

Time Warner offers business-class services in some areas, says spokesman Mike Luftman, but the company's primary focus is residential users.

The Time Warner market that's most developed for business-class service is Portland, Maine. Portland has more than 2,000 business-class subscribers, says Jim MacKay, director of business development for Time Warner in Portland.

A basic commercial account for \$80 per month includes access to a commercial help desk. The help desk will assist

end users with any technical problems, including VPN support, and companies can view the progress of any trouble tickets involving their remote workers through a Web-based application.

Time Warner's Portland office offers a high-end package with a 2M bit/sec downstream and upstream committed information rate service for \$600, but their Portland business packages don't include service-level agreements (SLA).

"It's a month-to-month service, rather than a long-term service, so we didn't see the need for SLAs," MacKay says.

A large cable firm concentrating on getting business-class customers is Comcast. Through its Comcast Business Communications unit, it offers managed Internet, data and voice services designed for businesses and telecommuters.

Comcast Commercial Internet Service 2.0 includes a cable modem, router and server; 24-7 monitoring of the network connection; and speeds ranging from 512K to 2M bit/sec.

Telecommuter packages offer connec-

tivity from 256K bit/sec and up, backed by 24-7 network monitoring. The company's list of corporations using Comcast for telecommuters includes Merrill Lynch and AT&T.

And, notes Comcast spokeswoman Sherrie Walters, Comcast is one of the few cable companies targeting former NorthPoint customers. The company is offering stranded NorthPoint users packages that include free installation. ▀

www.nwfusion.com

CABLE CONUNDRUM

Wondering whether cable is right for your business? Go online to get up to speed on the technology and what it has to offer.

DocFinder
4235
find it online



To become an **e-business**, some companies
suggest you throw everything away.

We suggest you
throw away their
business cards.

Rather than looking at what you don't have to get started in e-business,
Unisys people look at what you do have. We use our decades of
experience and can-do spirit to find solutions that fit your particular needs.
We're not looking for a quick sale. We want a long-term partnership
that starts from where you are and takes you to new levels of success.

Visit our website at www.aheadforebusiness.com.

UNISYS

We have a head for **e-business**.

© 2001 Unisys Corporation. Unisys is a registered trademark of Unisys Corporation.

VPN. VOIP. SAN. LOVE.

Data

IP Solutions

Managed Hosting

IT Consulting

No one offers
a more compre-
hensive suite of
IP products than
Broadwing. VPN, VoIP,
Data Collocation, Dial-
Up Internet, Integrated
Access, Web Hosting,
eCommerce. They're all
here, at your fingertips,
on one of the industry's
most reliable Internet
backbones. Better yet,
these products are all part
of the world's first end-to-end,
all-optical network. A network
you can love. That'll love you back.

Call 1.800.BROADWING or visit Broadwing.com

Broadwing

The world's first beautiful network.™





Carriers & ISPs

The Internet, Extranets, Interexchange
and Local Carriers, Wireless, Regulatory Affairs

Briefs

Federal Communications Commission Chairman Michael Powell has recommended that Congress increase penalties for incumbent local exchange carriers that violate competition provisions of the Telecommunications Act of 1996 from \$1.2 million per violation to \$10 million. Powell also asked that the FCC be given more time to investigate competition complaints. Currently, the agency must complete its investigations within one year.

Application service provider Interliant and international carrier Infonet are teaming to provide managed application services. The companies last week announced Infonet will private-label Interliant's messaging services, featuring managed Lotus Domino applications. The services include round-the-clock availability, service-level agreements and worldwide, in-country help-desk support. Infonet serves more than 2,600 multinational companies with its private network that has access points in more than 180 countries.

In an effort to expand its Web hosting business, Sprint last week unveiled an application infrastructure management platform that forms the software base for hosting applications at the company's Internet centers. Sprint has four centers working now and plans to build nine more by year-end.

The new platform ties Sprint's Internet backbone to the company's Web hosting centers so clients can outsource Web-enabled business processes. It also links Sprint's cellular network to the hosting centers to provide mobile commerce capabilities.

CLEC jumps into Gigabit Ethernet fray

BY MICHAEL MARTIN

Competitive local exchange carrier Time Warner Telecom is readying Gigabit Ethernet and other high-speed services via its new dense wavelength division multiplexing platform.

The carrier, which operates in 39 metropolitan areas across the U.S., recently agreed to spend an unspecified sum on LuxN's WavSystem DWDM equipment, which lets providers push up to 16 channels over a fiber pair.

"Basically this will allow us to provide any service directly over DWDM without requiring SONET or additional fiber and will speed our time to market," says Jose Ladeira, TWT's director of transport technology. The DWDM equipment will also let providers increase capacity on nets in areas where bandwidth is running short.

TWT plans to use the gear to roll out OC-3 (155M bit/sec) to OC-48 (2.5G bit/sec) services, in addition to Gigabit Ethernet. These offerings would compete with high-end data services from traditional carriers as well as newcomers including Yipes

Communications and Telseon.

The carrier is already serving Gigabit Ethernet to one customer and will make the service available to others based on demand. Pricing has not been revealed.

Because the underlying DWDM technology is protocol-independent, TWT can also offer services such as Enterprise Systems Connection and Fibre Channel over DWDM for traffic traveling to and from data centers, Ladeira notes. Ultimately, TWT plans to use DWDM to offer bandwidth on demand.

TWT already offers a suite of traditional services including DS-1, DS-3, native LAN, SONET and voice.

The service provider, which began life as a partnership between Time

Warner and US West, has recently experienced rapid growth. TWT has increased its presence from 24 to 39 markets since the start of the year, thanks in large part to its purchase of most of the assets of bankrupt provider GST Telecommunications last fall. By year-end, TWT plans to be in 44 cities.

Even though Time Warner still owns 47.8% of TWT, the firm is independently run. Last year, Time Warner took in more than \$487 million in revenue and earned \$1.2 million.

TWT has managed to become one of the few profitable CLECs in the U.S., says Jeff Moore, an analyst with research firm Current Analysis.

"One of the keys to their success is that they're facilities-based," he says. "They have a lot of fiber, 21 Class 5 switches and 21 markets with data centers."

While TWT operates in 15 Tier 1 cities,

Moore notes the provider also serves a large number of Tier 2 markets, such as Greensboro, N.C., and Memphis, Tenn., where the competition for customers isn't as fierce.

Time Warner Telecom: www.twtelecom.com

PROFILE: TIME WARNER TELECOM

Location:	Littleton, Colo.
History:	Founded in 1993, built national IP backbone in 1999; acquired assets of GST Telecommunications in 2000.
Services:	Point-to-point circuits, native LAN services, ATM, ISP and carrier offerings.
Markets served:	39; plans to be in 44 by year-end.
CEO:	Larissa Herda
Revenue:	\$487.3 million in 2000
Employees:	1,600+

CEO
Larissa
Herda



Equant airs international IP VPN service

BY DENISE PAPPALARDO

LAS VEGAS — Equant last week launched an integrated IP VPN service that the company claims will be able to save customers money by reducing the number of connections required and the amount of equipment needed.

The Advanced IP VPN service, announced at NetWorld+Interop 2001, is a fully managed offering that can carry voice, corporate data and Internet traffic over one connection.

The offering lets users set up a business exchange with partners, a corporate intranet for employees, a voice-over-IP net-

work and a link to the public Internet on the same T-1 line, says Jim Forbes, an Equant vice president.

"Previously users were required to have separate [electronic data interchange], extranets and voice networks," he says.

Equant uses Cisco gear that supports Multi-protocol Label Switching (MPLS) that lets the service provider more intelligently route packets over its network. The carrier deploys a Cisco router at each customer site on a VPN.

These routers, which can be as small as Cisco's 800 series or as large as its 7000 series, have queuing technology that can be used to divvy up bandwidth

for specific traffic types or applications. For example, a VPN customer with a T-1 line can dedicate 200K bit/sec to voice traffic, 700K bit/sec to corporate data traffic and the rest of the bandwidth to Internet traffic.

The service, available in 135 countries, is priced based on location and bandwidth. Customers will pay a flat rate for all T-1 VPN connections in the U.S. and a different rate for T-1s in Europe or Asia.

Beyond that, Equant would not provide specific pricing.

While other service providers, such as AT&T and WorldCom, are offering MPLS-based VPNs, these services are not available internationally.

Equant: www.equant.com





Eye on the carriers . Lisa Pierce

CONTRACTS SHOULD FOCUS ON TOTAL REVENUE

In uncertain economic times, it makes sense to closely examine how commitments between service providers and businesses are crafted.

These contracts commonly require a minimum annual revenue commitment for each year covered. Many require minimum or maximum volume or revenue

commitments by type of service, or even by jurisdiction — for instance, outbound voice calls within a state.

The problem is in tough times, these

provisions expose companies to unnecessary risk. An alternative — based on total revenue, irrespective of other variables — is worth consideration.

Let's say a customer spends \$7 million per year with one of the national voice and data services providers. The client has signed a three-year plan and agreed that at least \$4 million of the annual commitment will be for inbound and outbound voice services, and \$3 million will be spent on data.

The customer is concerned because a growing proportion of call center traffic is being handled through its Web site. Thus, voice spending is decreasing, violating the subminimum voice services revenue commitment. However, the growth of data services is not enough to offset the decline in voice or maintain the \$7 million total commitment.

The client's business is also closely linked to the economy, and if a downturn lasts more than a year, the company may have to curtail new ventures, lay off employees or sell divisions. Any such contingency will further depress spending on voice and data services.

Typically under these circumstances, an organization would renegotiate its contract and make future revenue commitments well below its historic WAN spend rate. However, this usually requires the customer to pay a higher per-unit rate — something customers loath to do. Additionally, should spending exceed the revised commitment, many providers do not automatically discount prices on the higher levels.

It's an unhappy dilemma. However, the alternative — focus on total revenue, nothing else — may help.

The organization renegotiates a contract that concentrates on the total revenue it is comfortable committing to the provider. The contract does not specify a minimum annual revenue commitment, nor does it contain commitments by service or jurisdiction.

It includes negotiated prices for the services the customer intends to use. The new agreement is in effect until the customer spends the amount of money specified, let's say \$16 million.

Using our example, at current spend rates, the contract will be in force for between two and a half and three years. But, if the customer has problems and consequently reduces WAN spending, the contract stays in effect for as long as it takes to spend that \$16 million.

This type of commitment avoids the ups and downs associated with a changing economy. It frees the customer from being a forecaster of future requirements. And it still provides the carrier with a predictable revenue stream.

This little-used contract approach should have far broader appeal.

Pierce is director of telecommunications at Giga Information Group. Her column appears biweekly beginning this week.



President George W. Bush, by Spotlight

California Governor Gray Davis, by Candlelight

By spotlight or candlelight, you'll never be in the dark about the energy crisis.

Power crisis or not, the show must go on. As the politicians put their spin on the energy crisis, you'll see it live and in color, thanks in part to Quick Eagle.

Your favorite news and entertainment networks, as well as some of the largest cable service providers, rely on Quick Eagle's broadband access platforms to keep the news feeds coming in. From the bright lights in the White House, to flashlights in the California Governor's Mansion, our Multilink Platforms deliver the news without fail—so you're never in the dark.

But you don't need to be a television network to get the benefits of multilink. You, too, can depend on Quick Eagle's IP Access Platforms to deliver the high speed

access you need and the managed services you want, 24x7x365.

Shed some light on why multilink is perfect for your business by downloading our whitepaper on Multilink WAN Service Solutions at www.quickeagle.com/library/whitepapers/whitepapers.html

Available from the world's finest Carrier Networks or a Value Added Reseller near you. Or call us at 888-280-5465.



IP Access for Managed Services



The Edge

Service provider developments at
the juncture between the enterprise
and the new public network

Briefs

PrismTech, a developer of integration server technology, along with members of the TeleManagement Forum last week unveiled the Integration Framework Catalyst Project.

The Integration Framework Catalyst Project combines equipment, applications and technologies from forum members, including Cisco, Component Insights, Hewlett-Packard, Info Objects, IGS, IONA and Telcordia Technologies.

The project defines a standards-based operational support system platform to enable differentiated services, faster time to market, and lowered procurement and deployment costs for service providers. It is also designed to enable rapid delivery of IP-based services through "flexible and efficient" operations support.

TM Forum: www.tmforum.org;
Prism: www.primstechnologies.com

Quick Eagle Networks last week announced the second offering in its new line of IP access platforms for managed services.

The 5800 IP Access Platform aggregates eight T-1 lines or six E-1s in a multilink bundle to provide a 12M bit/sec IP access line. The 5800 is designed to offer multilink frame and multilink PPP standards-based services.

The 5800 IP Access Platform runs Quick Eagle Service Application Pack, software that provides a set of managed service applications. Such applications include multilink T-1/E-1 access, RMON-1 and RMON-2 monitoring, 12M bit/sec IP and frame relay service-level verification.

Quick Eagle's 5800 starts at \$7,499 and will be available in July.

Quick Eagle: www.quickeagle.com

WaveSmith unveils ATM switches

Company looks to help service providers retain existing service revenue while migrating to IP.

BY JIM DUFFY

Start-up WaveSmith Networks has unveiled its product line — two switches for migrating ATM multiservice nets to IP and Multi-protocol Label Switching.

WaveSmith emerged earlier this year with a business proposition to let service providers increase revenue in their "legacy" ATM and frame relay services while making a gradual migration to IP and MPLS at the multiservice access side of their networks. The firm said then that upgrading networks to deliver new services is a capital-intensive undertaking, and concentrating on supporting current services while gradually migrating infrastructures to deliver new services and new revenue is the only practical way to upgrade (www.nwfusion.com, DocFinder: 4232).

"The biggest concern is that fast packet services today are one of our largest streams of revenue," says Stuart Elby, executive director of next-generation network architectures at Verizon, which is planning to beta-test the Wave-

Smith switches. "IP today is still relatively small in comparison to revenue generation. We certainly can't start investing in an infrastructure for IP that basically strands or even possibly hurts our investment and continued growth in ATM and frame relay."

Elby says Verizon's current ATM switch vendors have unappealing IP migration strategies and/or platforms that are old and insufficient for continued growth and service breadth.

With that, WaveSmith unveiled its DN4100 and DN2100 switches last week. Both switches support a switching capacity of up to 30G bit/sec, which helps fill a current void in the ATM-to-IP migration platform offerings.

"There's been a really big gap after 25G bit/sec," says Christin Flynn, an analyst with The Yankee Group. "Between 25G and 180G bit/sec, there's just nothing there for a service provider to roll to in their networks."

The DN4100 features five front and five backside slots. The front slots hold forwarding modules and dedicated

See **WaveSmith**, page 30

Catch the WaveSmith

Features of the DN4100 and DN2100 multiservice switches:



- 30G bit/sec full-duplex switching.
- DS-1 to OC-48c interfaces.
- Supports provisioning of ATM, frame relay and IP services.
- Expandable port densities through stacking via dedicated chassis interconnect.
- 128,000 VC/IP flows per forwarding module.
- 5,000 call/sec per forwarding module.
- 10 times the performance of leading ATM switches in 1/10 the footprint.

Cisco to release IPv6 features throughout products

Three years and many downloads later, the new protocol is ready to roll.

BY JIM DUFFY

SAN JOSE — In a move that may catalyze the industry to begin migrating to the new protocol, Cisco last week announced availability of IPv6 features across products that run the company's IOS operating system software.

After three years and an extensive beta-testing program that involved several hundred unique downloads of the software by its customers, Cisco will ship the "first phase" of IPv6 on virtually all its IOS-based devices at the end of this month. Cisco's high-end routers — namely the Catalyst 6500, 7600 OSR and 12000 series GSR — use ASICs to forward data and will get IPv6 in six to 12 months, says Martin McNealis, director of product management at Cisco's IOSTechnologies Division.

IPv6 offers expanded IP addresses, integrated autoconfiguration for ease of

installation, quality of service, and enhanced mobility and security. It is expected that IPv6 will solve the IP address shortage pending with today's IPv4.

To date, users and service providers

have not embraced IPv6 because they can work around IPv4's address shortage issue using network address translators. But McNealis says many factors will exhaust this workaround and in essence force the adoption of IPv6. Those factors include:

- the continued proliferation of Internet devices, such as personal computers, PDAs, wireless devices, and new Internet appliances;
- emerging populations around the globe;
- the phenomenon of "always-on" Internet access;
- new Internet applications such as multiuser gaming and Internet telephony.

Issues such as a security flaw in Mobile IPv6 still need to be worked out, McNealis admits. The discovery of secur-

See **Cisco**, page 30

www.nwfusion.com

IP INCOMING

IPv6 is coming — are you ready?
Check out our IPv6 research page
and listen to an audio primer on
how the technology works and
improves on IPv4.

find it **4238** online

PacketLight introduces gear to pack MAN fiber

Start-up says its equipment is more bandwidth-efficient.

BY TIM GREENE

KFAR-SABA, ISRAEL — PacketLight Networks is building optical switches for metropolitan networks that the company claims pack traffic onto wavelengths of light more efficiently than SONET.

Rather than leave time slots empty as SONET does when there is no traffic assigned to them, PacketLight gear adds traffic onto wavelengths whenever and wherever there is available bandwidth.

While the equipment uses SONET framing for restoration, it uses Multi-protocol Label Switching (MPLS) as a control layer that shapes traffic and enforces quality of service. The MPLS labels on the traffic are used to establish end-to-end connections across the network.

PacketLight claims this method is more bandwidth-efficient than dedicating an entire wavelength to a single type of traffic as competitors ONI Systems and ADVA Opti-

cal Networking do. Dedicating wavelengths leaves large chunks of bandwidth unused when demand for a particular traffic type is low.

PacketLight is building two switches called SiteLight and CentralLight. SiteLight gathers customer IP, ATM and leased-line time-division multiplex (TDM) traffic from customers, packetizes it and drops it onto a metropolitan fiber network.

CentralLight aggregates traffic from multiple SiteLights, sorts it and passes it on to all-optical core networks.

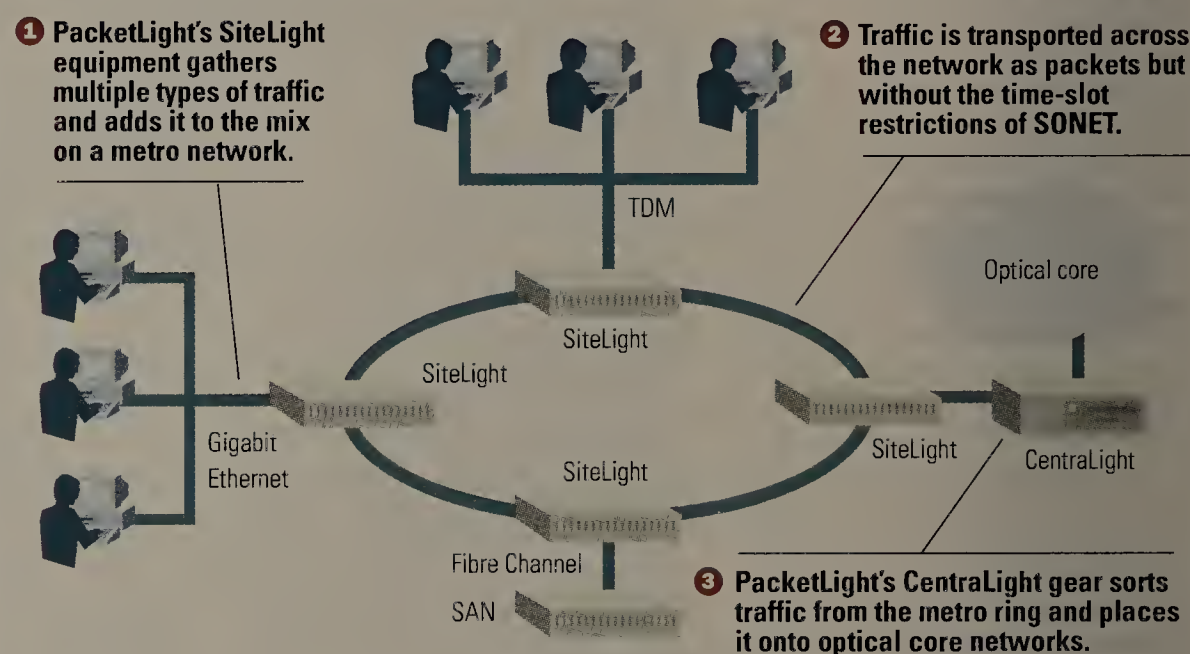
PacketLight gear supports dense wave division multiplexing so service providers can add more bandwidth to their networks by turning on another wavelength of light. The equipment supports up to 28 wavelengths.

These extra wavelengths can be shared by all traffic, or they can be engineered to bypass certain nodes on the network to express select traffic.

SiteLight and CentralLight equipment can be arranged in

PacketLight makes the most of metropolitan fiber

Service providers can use PacketLight gear to pack traffic onto metro optical networks.



point-to-point configurations or in rings to take advantage of metropolitan fiber already installed for SONET. PacketLight switches can function as add-drop multiplexers, con-

verting optical signals to electrical and pulling off traffic meant for that particular node. The switches then add traffic outbound from that node and regenerate an optical signal.

Customers can connect to PacketLight gear via 10M bit/sec, 100M bit/sec or Gigabit Ethernet, Fibre Channel or OC-12 ATM, TDM or packet-over-SONET interfaces.

PacketLight is based in

Israel and is backed by \$29 million from venture capitalists as well as telecom equipment maker ADC.

PacketLight is showing its equipment next month at the SuperComm show in Atlanta. Prices have not been set. The equipment is scheduled to go to beta testing in the fourth quarter and ships in the first quarter of next year.

PacketLight: www.packetlight.com

WaveSmith,
continued from page 29

switch interconnect modules, while the backside houses interface modules with speeds ranging from DS-1 to OC-48.

The DN2100 features three front and three backside slots. It supports the same forwarding, interconnect and interface modules as the DN4100.

The switch interconnect module lets service providers "stack" up to five of the switches together up to 50 feet apart. Each shelf connection supports redundant 30G bit/sec links.

The DN4100 supports up to 15 OC-48s on a stack and up to 640 physical T-1s, or 1,680 DS-1 channels from 12-port channelized DS-3 modules. This is 2.5 times the DS-3 density of Cisco's MGX 8850, Nortel Network's Passport 15000 and Lucent's CBX 500 ATM switches, the firm says.

Stacking lets the switches scale from low-end access

requirements, through collocation and wiring center applications, to regional central office installations, WaveSmith says.

The DN4100 is 7 inches high by 17.5 inches wide by 17 inches deep. The DN2100 is half the height of the DN4100, and both are considered very small footprints for the switching capacity they support.

Forwarding modules can be custom-built with ATM, frame relay or IP/MPLS processors. Each forwarding blade supports 128,000 virtual circuits or IP flows — or 1.92 million per stack of DN4100s — and 5,000 calls per second of forwarding performance.

This capacity compares favorably to Lucent's CBX 500 which, when equipped with a flow control processor, supports less than 10,000 virtual circuits per chassis, WaveSmith claims.

Other key attributes of the WaveSmith switches are the so-called Open Call Model and

the microkernel architecture of the switches' operating system, which runs processes in protected memory.

Open Call Model is essentially a single control plane to manage connection setup of ATM, time-division multiplexing, frame relay and IP circuits, and services for voice and data. It uses the Media Gateway Control Protocol, which is used by softswitches to control Signaling System 7 systems in the telephone network.

The operating system's microkernel architecture lets any process be upgraded or repaired independently of the others while the switch continues to run, WaveSmith says.

The DN4100 and 2100 switches go into beta test next month. Genuity and Cable & Wireless are on the list, in addition to Verizon. Volume shipments are slated for the fourth quarter at a starting price of \$30,000.

WaveSmith: www.wavesmithnetworks.com

Cisco,
continued from page 29

ity flaws in the proposed Mobile IPv6 protocol means the Internet Engineering Task Force will have to develop a new method for authenticating roaming devices that use IPv6 addresses.

This development means months of delays for Mobile IPv6, which was conceived a decade ago and thought to be in its final form (www.nwfusion.com, DocFinder: 4233).

"This mobility registration process . . . is nontrivial but understood," McNealis says. "We don't view it as insurmountable."

Another negating factor is the lack of IPv6 clients in

the network.

"The technology and functionality are there," McNealis says. "We need clients to smooth the migration."

Cisco's IPv6 code will ship in IOS software release 12.2(1)T. Platforms to be supported at this time include: Cisco's 800, 1400, 1600, 1700, 2500, 2600, 3600, 4500 and 4700 series routers; AS5300 and AS5400 Universal Access Servers; and 7100, 7200 and 7500 series routers. ■

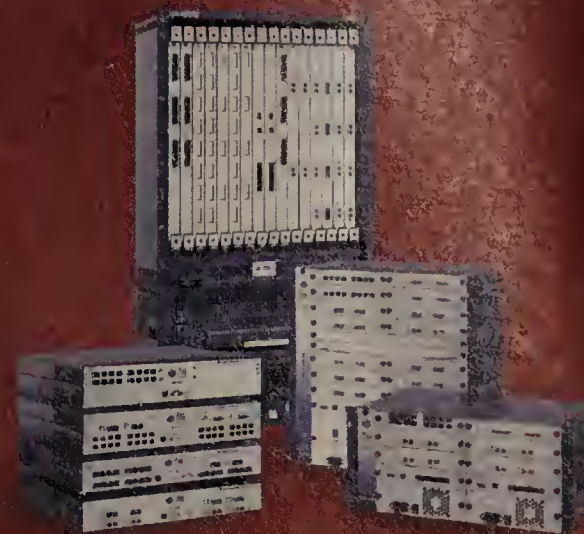
View from
The Edge

Subscribe to our
free newsletter.
DocFinder: 5434





GIGABIT ETHERNET, SONET, ATM. SHOOT, IF
YOU WANTED A NETWORK MADE OF HAM,
WE COULD PROBABLY CONNECT TO IT.



Not just connect to it, but deliver profitable services over it. At Riverstone Networks,™ our RS family of routers delivers wire-speed metropolitan area services over any network, including Gigabit Ethernet, 10-Gigabit Ethernet, SONET/SDH, ATM, WDM, TDM, and cable. In fact, Riverstone routers convert raw bandwidth into profitable services in all parts of the Metropolitan Area Network. Whether it's dynamic bandwidth provisioning, MPLS-based VPNs, tiered services, or anything in between, Riverstone customers profit from intelligent bandwidth on both legacy and next generation networks. All Riverstone technology scales across the entire product line, from our compact RS 1000 Optical Metro Access Router, right up to the RS 38000, our 170 Gigabit Metro Core Router. To build a network that really brings home the bacon, contact Riverstone at 1-877-778-9595, or visit riverstonenet.com/www.



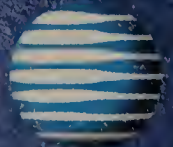
**River
STONE**
NETWORKS.™

Bandwidth with Brains™

Every Web site should be
this well protected.



WEB HOSTING: At AT&T Business, we treat your Web site like the mission critical application it is. We wrap it in the redundant power, security, environmental and fire protection of our world-class Internet Data Centers. Then transport your content and applications over the AT&T IP backbone; it's state-of-the-art in speed, security and reliability. All while our dedicated staff monitors and maintains your systems 24/7. At AT&T Business, the protection we give you is hard to knock.



AT&T Business

Innovative Networks. Innovative Thinking.SM

©2001 AT&T Business

For secure, reliable, and scalable Web Hosting
Call 1 866 375-0267 or visit www.att.com/business/hosting



Briefs

McAfee has announced a new antivirus gateway service and software. The company says it offers gateway antivirus services through its **McAfee ASaP** suite and has also debuted a new antivirus appliance, the **WebShield e500 ASaP**. Through McAfee ASaP services, the company provides constant security monitoring and administration for managed service providers and their customers. McAfee will sell the service to service providers, which will, in turn, offer it to end users. The WebShield e500 ASaP device is installed at a company's e-mail gateway and can scan up to 100,000 e-mail messages per hour for viruses, McAfee claims.

The WebShield e500 ASaP, which runs on Windows NT and 2000 and Novell Network IP, is available now and costs \$10,000 for up to 250 users.

McAfee: www.mcafee.com

Application service provider Agilera has a new CEO and a new focus. Last week the company announced that President and COO Robert Unger would take over as CEO, replacing former Chairman and CEO Paul Rudolph, who left to pursue other opportunities. Unger says he will lead a companywide "streamlining" that will include an undisclosed number of layoffs, as well as the consolidation of business development resources into seven metropolitan areas: New York, New Jersey, Dallas and Houston, Atlanta, Los Angeles and San Francisco, Denver and Chicago. Unger says Agilera is also trimming its application offerings, focusing on services that experienced the greatest demand. The company tagged Oracle, J.D. Edwards & Co., SAP, Ariba, Siebel and Lawson Software as "key relationships."

Agilera: www.agilera.com

Tool detects net privacy problems

BY CAROLYN DUFFY MARSAN

Privacy consultancy PricewaterhouseCoopers has teamed with Watchfire, a maker of Web site analysis and reporting tools, to develop software for monitoring privacy compliance across internal and external Web sites.

Called WebCPO, the new software is due for release this month. Both companies will sell WebCPO, which is geared toward financial services and healthcare firms facing new online privacy regulations. WebCPO offers automated monitoring, analysis and reporting of potential privacy compliance problems as well as real-time alerts. The jointly developed software combines PricewaterhouseCooper's privacy risk assessment processes with Watchfire's Web site crawling engine, which can scan through one million Web pages in just 17 hours. With WebCPO, Watchfire has applied this technology to search for cookies, Web bugs, data spills and other potential privacy problems.

"It's a huge headache for IT executives to be hunting down privacy land mines in

their Web sites," says Watchfire CEO Michael Weider.

Weider says WebCPO will work for the largest corporate Internet and intranet sites — even those that top five million pages. And it will accommodate the newest Web technologies, including dynamic content, Java scripts and Flash.

Other privacy management tools such as iDcode's PrivacyWall monitor Web site traffic and look for privacy-related information, such as age and credit card numbers, being collected or shared. WebCPO, on the other hand, crawls through Web site pages to find privacy problems before suspect information is sent out over the Internet.

Like Watchfire's Enterprise Solution, the WebCPO package is server software that

Common privacy problems defined

PricewaterhouseCoopers and Watchfire have teamed to develop software that scans Web sites for these types of problems:

Cookies:	Text-only strings that get entered into the memory of a browser and are used to track user behavior at a Web site.
Web bugs:	Graphics on a Web page or in an e-mail message that monitor who is reading the Web page or e-mail message.
Web beacons:	Electronic images that let a Web site count users who have visited that page or access cookies.
Data spills:	Personally identifiable information, such as name and e-mail address, that is sent back to Internet marketing companies via banner ads.

runs on Windows NT and 2000 platforms. WebCPO pricing starts at \$15,000.

The Watchfire Enterprise Solution lets IT departments scan Web sites for 50 different accuracy problems, including broken links and misspellings. The software sits outside the firewall and acts as a surrogate user, running transactions against a Web site to test for problems.

Watchfire: www.watchfire.com

Radiant software eases directory-data integration

BY JOHN FONTANA

NOVATO, CALIF. — The idea behind a metadirectory — to aggregate data from various sources and translate it into a single entity — sounds familiar to some. To Radiant Logic, it sounds like a database.

With that in mind, the company is introducing its RadiantOne Context and Coordination Server. The server is a metadirectory that at its core is a relational database engine which aggregates and synchronizes data from directories, applications and other sources.

The server uses a directory front end merely as a presentation layer to give end users a familiar hierarchical design for searching data, much like Windows Explorer.

The unique combination of database engine and directory front end may have appeal to IT executives in that they can use their existing database infrastructure and knowledge, and avoid the costs and retraining needed to deploy a traditional metadirectory.

Traditional metadirectories combine a directory for data storage and a set of

sophisticated, and often complex, rules for collating, synchronizing and updating data from different sources.

Radiant Logic believes a database, with its ability to synchronize, extract and log data, combined with its transaction capabilities is a natural for that same role.

"Radiant Logic is saying the job of a metadirectory is translation of data, but the database guys have already figured out how to do that so why not use it?" says Earl Perkins, an analyst with Meta Group. "No

one has executed this directory and database integration but it sounds good on paper. The question is, are they really integrating the two or are they building a kludge? I want to see this thing in action."

While the database concept is unique to Radiant Logic, Oracle builds a Lightweight Directory Access Protocol (LDAP) directory on top of its database, although it is not a metadirectory. Novell, Microsoft, Critical Path, Siemens and iPlanet have metadirectories that have a directory at the core.

The RadiantOne server uses Radiant Logic's Virtual Directory Server, which stores database queries as LDAP objects. The objects, when accessed from the directory, fire off queries to a database that return real-time data, such as a whether or not a user has the right to access an application.

The server runs on Windows NT and 2000 or on the Java 2 platform, Enterprise Edition. The server supports iPlanet Directory Server, IBM's SecureWay and Microsoft's Active Directory.

It is priced at \$50,000 and is expected to ship in July.

Radiant: www.radiantlogic.com

www.nwfusion.com

META-MANIA

Go online to get an overview of metadirectories and the latest news from the market.

find it **4234** online

'Net Insider . Scott Bradner

BELL-IZING THE INTERNET?

For a bill titled "The Internet Freedom and Broadband Deployment Act of 2001," and which says Internet access services should "not be subject

to regulation by the States," House Resolution 1542 certainly has freaked out some pro-Internet folks.

The claim has been made that it

would kill IP telephony and hand the Internet over to the big, bad telephone monopolies. I have a hard time figuring out what all the panic is about, but some smart people seem to be panicking.

The proposed legislation ostensibly fixes some problems in the Telecommu-

nications Act of 1996 that have let the Federal Communications Commission impose regulations that have "impeded the rapid delivery of high-speed Internet access services, thereby reducing customer choice and welfare."

Endangering our very welfare! Bad juju, indeed.

A little more reading of the bill and the picture might be a bit clearer. The welfare that seems to have been threatened is that of the Bell operating companies. And that is because the big bad FCC has said that the poor Baby Bells, the few that are left after the merger-itis attacks of the past few years, cannot offer Internet access service that crosses local access and transport area boundaries (going between phone regions). This seems to have, in the eyes of the bill's authors, "impeded the development of advanced telecommunications services."

I admit to being more than a bit skeptical that a Bell operating company would develop anything that anyone but it would call advanced telecommunications services. In the past, the term "advanced" has meant things such as the *69 call-back feature. Not all that earthshaking.

But with their money as a driver, the Bells could sure mess up the competitive landscape by offering brain-dead services that could confuse customers into thinking they were getting real Internet access. Rewarding phone companies for their supposed ability to innovate seems like a broken system to me, but does not seem to be the end of the Internet world.

What else might be wrong with this bill? It tries to legally define the Internet, and doesn't do too bad a job. Some people might think defining the Internet will remove some of the mystery, but I'm not one of them.

A number of people have pointed to Section 6 of the bill as maybe banning Internet telephony. I cannot tell — the section is worded in the special language that seems to be endemic to many in Washington — full of words but unclear in actual intent (i.e., lawyer fodder). The surface meaning is that it keeps the Bells from using IP telephony over any new inter-LATA Internet connections to get around the fact that they cannot offer long-distance phone service. That may be in fact what it means, but if so, that would be a good thing. Who can tell what trickery lies in the hearts of the phone company supporters?

Disclaimer: Harvard builds lawyers and some of them might like this bill, but I did not ask.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

IP PBXs YOU'VE GOT Questions. WE'VE GOT Answers.

MIERCOM'S "2001: IP TELEPHONY"— The Definitive Special Report on IP PBXs.

The only spin-free, hands-on analysis available today.

Miercom's Special Report provides detailed analyses and lab-test results of IP PBXs from • Alcatel • Cisco • Mitel • NEC • Shoreline • Sphere • Vertical ... and others.

For each IP PBX you'll find comparative performance results on:

- Voice Quality (MOS Ratings, Interactive, and more)
- Call completion rate/reliability
- Redundancy and fail-over capabilities
- Latency
- IP bandwidth consumption

SPECIFICALLY ADDRESSED IN THIS SPECIAL REPORT:
IP PBX architectures; Station equipment; Call-control platforms; IP-enabled vs. IP-centric; Soft phones; PBX features; Application software add-ons (Unified Messaging; Call-center support); IP Phones and in-line powering; Management and monitoring; IP-to-PSTN trunk fail-over; Standards; VoIP interoperability ... and lots more.

Call to reserve your copy, for details or for pricing.

Miercom

1-800-MIERCOM
(1-800-643-7266)

QUARTERLY UPDATES AVAILABLE THROUGH 2001.

The leading edge in networking information



Technology ^{Update}

**An Inside Look at the Technologies
and Standards Shaping Your Network**

Ask Dr. Intranet

By Steve
Blass

We have a Windows 2000 VPN for remote users. We authenticate them with Radius to our NT 4.0 primary domain

controller and assign 192.168.X.X addresses through Dynamic Host Configuration Protocol (DHCP). It is not in production for two reasons.

1. Remote users connect to their ISP, use the VPN adapter, and are given a full complement of DHCP-provided information, including the addresses of our DNS servers. The problem is that the clients keep flapping between the internal DNS server and the ISP-provided DNS server. This makes the mail server available, unavailable and available again. Successive pings to the DNS name of the mail server return the external address, then the internal, then the external, and so on.

2. We also have problems passing the subnet mask to dial-up clients.

Turning off the use of the ISP-provided DNS server on the dial-up clients will force VPN-connected sessions to use your internal DNS servers. This may require a separate connection setup configured with the IP address of your VPN gateway so the client can find the VPN server without using DNS.

The subnet mask trouble may be related to the DNS flapping between two network adapters, but see if there are conflicts in your dial-up DHCP server configuration and interface settings.

Blass, a network architect at Change@Work in Houston, can be reached at drintranet@changeatwork.com.

Open-call model liberates ATM switches

BY CHAD DUNN

Over the years, telephony products have gained a reputation for reliability. One of the reasons is that they support multiple protocols and can pass various types of voice traffic on a single platform.

A new architecture, called open-call model, can give data platforms similar measures of flexibility — it lets each service control its own calls across a network platform. Instead of trying to map different types of service signaling between ATM and various edge/core technologies, an open-call architecture opens the control fabric to all types of traffic.

This enables a new breed of multiservice switch in which one side of the connection is controlled by an IP call control softswitch, and the other side of the connection is Multi-protocol Label Switching (MPLS)-signaled. For example, if voice is going to be carried over data networks (such as voice over DSL or cable modem) along with other multiservice backbone traffic feeding IP service cores, carriers might want those voice circuits to be controlled by something that understands their nature, such as Media Gateway Control Protocol (MGCP).

In an open-call model, the multiservice control plane becomes transparent, open to any flavor of call control — MGCP for voice, Private Network-to-Network Interface (PNNI) for ATM traffic, or MPLS for IP. These are some of the signaling technologies that could control calls in a multiservice network. Old ATM systems only know PNNI and static provisioning, but a new breed of multiservice ATM would let different services cross those borders freely.

Any of today's applications could be expanded and optimized for the constantly changing multiservice environment. VPN services, content caching, voice gateways and subscriber management could be controlled natively through an ATM- or IP-based service architecture using an open-call model. New service technologies could also be supported this way, leveraging whatever signaling techniques they required.

An open-call model brings the greatest advantage in opening a multiservice architecture and letting providers flex their technology and business options.

It is a transitional and lasting change because the architecture doesn't restrict technology choices. The open-call model not only joins old ATM and new IP networks, but it also creates a service environment that lets them grow closer together, meld with other network technologies, and even separate again if need be.

For example, the services that are

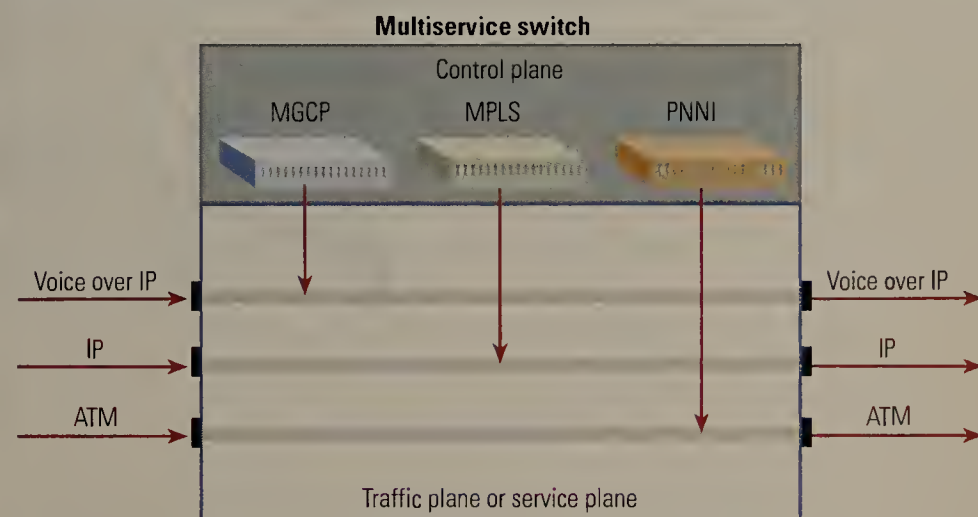
can be provisioned with flow-through management, using open protocols such as Common Object Request Broker Architecture to interface directly with any of the world-class operational support systems.

The flexibility of an open-call model helps ease some of the looming hurdles that await the migration from multiservice ATM to next-generation IP. It creates a

HOW IT WORKS

Open-call model

This architecture opens the control fabric of an ATM switch to all types of traffic, letting service providers mix and match traffic types and control protocols.



1 Voice-over-IP traffic could be controlled by Media Gateway Control Protocol (MGCP).

2 IP traffic could be controlled by Multi-protocol Label Switching (MPLS).

3 ATM traffic could be controlled by Private Network-to-Network Interface (PNNI).

mixed on a regional Bell operating company's network might be coming from unregulated subsidiaries and from the carrier's separate business private-line and public switched telephone network service entities. Each wants a means to control its own circuits across the net using whatever protocols and provisioning/billing/management systems make sense.

An open-call model lets providers directly control network elements and tie them into existing network management systems. Whereas legacy platforms use a proprietary management interface that requires a gateway to the carrier's network operating system, an open-call model lets the carrier's operating system interact directly. Circuits

more agnostic environment in which services can exercise native control using ATM or any other transport architecture.

The bottom line for carriers and vendors is that merely opening up the data plane to multiservice traffic is the easy part. To truly facilitate the migration that the public network must undergo, the control plane of these products must be opened to let the management and call control models of the services be fully utilized. Only when this happens can carriers hope to have a smooth migration to future services.

Dunn is director of product management for WaveSmith Networks. He can be reached at chad@wavesmithnetworks.com.



“Linux is so totally dreamy!”

WHY *LINUX* HAS MORE FANATICAL DEVOTEES THAN A TEEN POP IDOL.

FIRST THE BRITISH INVASION. Now Linus Torvalds. One used mop tops and catchy beats to create a worldwide frenzy. The other used the arguably less sexy but equally effective concept of open standards. When Torvalds created the new Linux operating system, he took the "what's mine is mine and what's yours is yours" world of proprietary software and turned it upside down. The result? A true software meritocracy where anyone can share, refine and customize code that's open and available for all.

What does this mean for business people? It means that new e-business infrastructures can be rapidly adapted to particular business tasks. Companies will no longer be forced to adjust their processes to the only software available. Since Linux® is now the fastest-growing and most accessible operating system, it's where the best technologies will be created and arrive first, and where the greatest number of skilled staff and technicians will appear now and in the future. Linux is hardware-agnostic, so it can quickly begin to remove the massively cost-intensive task of integration across disparate platforms. These aren't just software advantages; they are real bottom-line

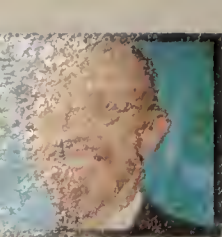
business advantages: reduced costs, faster time-to-market, clear competitive edge, flexibility.

Now the Linux community has a powerful, perhaps even unexpected, ally in IBM. The people at IBM have embraced Linux as a pillar of e-business and are committed to helping it grow through new technology, devoted specialists and active support to the entire Linux community. From across-the-board Linux enablement of IBM servers and software, to thousands of dedicated Linux developers and technical support experts, to porting centers where IBM Business Partners can test and refine their applications for Linux, IBM is backing Linux wholeheartedly.

Proof? Linux specialists at IBM Global Services recently helped Telia (Scandinavia's largest telecom and Internet service provider) consolidate a complex infrastructure of multiple UNIX® servers into one mission-critical, Linux-optimized IBM @server. One server capable of hosting more than 1,500 virtual Internet Linux servers simultaneously.

It's exciting stuff. And this is just the beginning. So if you think you can keep your composure, visit ibm.com/e-business for more information.





Gearhead . inside the network machine . Mark Gibbs

SPYING ON THE FLIP SIDE

"Silent background use of an Internet 'back-channel' connection must be preceded by a complete and truthful disclosure of proposed back-channel

usage, followed by the receipt of explicit, informed consent for such use. Any software communicating across the Internet absent these elements is guilty

of information theft and is properly and rightfully termed Spyware."

— Definition of "spyware" by Steve Gibson of Gibson Research Corp.

Gearhead's alter ego, of "Backspin" fame, was recently taken to task by a reader for recommending a piece of soft-

ware, the freeware version of a file transfer utility, because it contained spyware. And the reader has a good point.

Spyware, which is built into a number of shareware and freeware applications, is designed to fetch, cache and show ads, and then monitor and report on user behavior without informing users upfront that they will be monitored. Spyware is definitely to be distrusted in any situation.

The problem with spyware is you often don't know you have it! Many applications — usually those that have freeware versions — use advertising delivery systems that contain spyware provided by third parties.

Here's Gibson's summary of just such a third party, Aureate, now called Radiate: "It deliberately slips into the user's system secretly, uses the user's Internet back channel without the user's knowledge or permission, takes pains to remain secretly installed (instructing its hosting software to leave it installed upon the host's removal), masks its presence by deliberately suspending its use of the back channel in the [presence] of keyboard or mouse activity, and fails to disclose any of this to the typical user..."

"When you add to this the fact that the Aureate software has been conclusively found to be directly responsible for significant Windows system and Internet browser crashes, and that it is able to secretly download and cause Windows to execute any arbitrary program into the unsuspecting user's computer, it is indeed difficult to cut these people much slack."

The problem is spyware could not only be revealing private information about you but also could be a route for hackers to invade your PC or network (given the poor coding of most spyware, a hack attack by creating a buffer overflow is a real possibility). And some badly written spyware can cause your PC to crash because of the spyware's poor coding.

Gibson has developed a seven-point code of conduct for software that uses a back channel for reporting anything about a user's system, and an index of related software and the degree to which it complies with the code (see <http://grc.com/oo/cbc.htm>).

If you want to find out whether any applications on your PCs have spyware embedded, check out Lavasoft's Web site at www.lavasoft.de/aaw/. The company offers a utility called Ad-aware that "is a free multispyware removal utility that scans your memory, registry and hard drives for known spyware and lets you remove it safely."

Next week, we'll take a closer look at this topic and what Ad-aware can find and correct.

Until then, download the program and let us know what you find — we think you'll be horrified.

Results to gearhead@gibbs.com.

This June, the leading companies and conferences in technology take center stage in New York City.

Limited Engagement. One Week Only.

At PC EXPO, the expo portion of TECHXNY, you'll find mobile & wireless, business solutions, leading-edge Internet security advances, ASPs, the latest in Linux, storage technologies and more. The best products, services and real-world solutions—all delivered by the best vendors and solutions providers in the IT industry.

TECHXNY's full week of conferences, education summits and special events has something for just about everyone. The IT Innovation Conference focusing on innovative security solutions... an IT infrastructure built for speed... top-notch information-sharing architecture... Best of Brainshare... SAN and Clustering Summits... and the wide, wide, wireless world.

There's the Finance Exchange. Touched by an Angel for entrepreneurs. eTV World. Solutions Integrator Think Tech. PC Career Expo. Working Woman's W.E.S.T. Awards. Compelling keynotes. And still more targeted programs and events are on their way to bring you the cutting-edge of IT today.

To learn all about what there is to see, do, hear, and learn at TECHXNY this June, log on to www.techxny.com. And while you're there, make sure to register right away!

Flagship Sponsors

DOCULABS The New York Times Expect the World®

Novell. VERITAS

Sponsor of IT Innovation Conference

Forbes

Platinum Sponsors

COMPAQ

handspring

MWT Mirror World Technologies

Gold Sponsor

ANALYSTS INTERNATIONAL

Keynote Sponsor

BusinessWeek www.businessweek.com

W.E.S.T. Awards

WORKING Woman

REGISTER TODAY AT: www.techxny.com Use source code: M3AA

PC EXPO

TECHXNY

CMP

"Can I make my network future proof?"

"What LAN technologies should I avoid?"

"What are the best ways to support QoS in the LAN?"

"What are the essentials of campus security?"

"How do I create an architectural checklist for a voice-ready network?"

"Should I implement an Ethernet MAN?"

"How can I build a no-stop LAN?"

**FREE
ONE-DAY
EVENT**

Get answers to the most important LAN questions. Yours.

PLATINUM PRESENTING SPONSORS:

AVAYA
communication

Marconi.

Premium sponsorship opportunities are available for this event. Please contact Robin Azar at 508-490-6570, or razar@nww.com for details.

PRODUCED IN ASSOCIATION WITH:

TOLLY
GROUP

Would you like to ask hard-hitting questions? And get straightforward answers from respected LAN experts? Then register for **State of The LAN: The 21st Century Network**.

Network World's Town Meeting brings you face-to-face with industry leaders willing to share their ideas, insights, experiences, and visions. Access the knowledge to plan, build, support, and secure your LAN—now and in the future.

Kevin Tolly, president and CEO of The Tolly Group, sets the stage with an insightful keynote address, "The LAN/MAN Triple Play: Security, Web Acceleration and Voice Readiness," then moderates objective sponsor strategy presentations. John Gallant, president and editorial director of Network World,

leads interactive roundtable discussions on today's hottest LAN issues:

- Network management
- 10-Gigabit Ethernet in the LAN/MAN
- E-commerce acceleration
- Secure networking
- Voice-over-IP
- And more

The bottom line? You get answers to your LAN questions, so you can make better, more informed buying decisions—with confidence.

Do what more than 5,000 satisfied network professionals have already done—strengthen your knowledge at a FREE Network World Town Meeting. Register for **State of The LAN: The 21st Century Network** today. Any questions?

STATE OF THE LANSM
.....
The 21st Century Network
.....

**Register at www.networkworld.com/seminars/lan
or call (800) 643-4668.**

NetworkWorld
TOWN MEETING

Where technology leaders answer to you.

TOWN MEETING SCHEDULE

NEW YORK, NY
May 22
PHILADELPHIA, PA
May 23
WASHINGTON, DC
May 24
DALLAS, TX
June 12
DENVER, CO
June 13
CHICAGO, IL
June 14
SEATTLE, WA
June 19
SAN FRANCISCO, CA
June 20

Editorial

Searching high and low for network excellence

It's a rare person who likes to toil without any recognition for a project well done, especially if that undertaking has led to substantial business gains. I imagine most of you would prefer some kudos. For example, public acknowledgement by the CEO tends to increase workplace pride and can go a long way toward making the challenges and struggles of a difficult project more worthwhile.

Even better yet is broader public recognition. After all, who better appreciates the complexities of technology migrations, backbone upgrades and network overhauls than other network executives? Past winners of

our annual User Excellence Award have told us that sharing their stories with and earning the respect of their peers can be as gratifying as cutting over that final switch in their multi-million-dollar network projects.

That's one of the reasons *Network World* has the long-standing tradition of giving network executives the chance to earn their teams extra recognition through the User Ex Award program. Since our inception 15 years ago, this award has given us the chance to herald organizations that use network technology in particularly innovative and effective ways to further corporate goals.

We've had a lot of fun doing so. It's a privilege to meet people who take great pride in their professional accomplishments and to share their stories.

In 2000, our choices were tough, but Kent State University caught our eye among scores of entrants for building a converged voice, data and video ATM network out of the savings from Centrex bills. Lockheed Martin Missiles and Fire Control, Nationwide Insurance and the Port Authority of Allegheny County, Pa., took home runners-up awards. They join a prestigious list of former winners, organizations such as American Airlines, American Express Travel Related Services, Best Western, Duke University, Eli Lilly, First Boston, Ford, Hyatt, Olsten Staffing Services and Prudential Insurance.

We expect this year our task in selecting User Ex winners will be no less difficult. We know tons of you have great network accomplishments to share. Just head to Network World Fusion, at www.nwfusion.com, DocFinder: 4231, and fill out an entry form by June 11.

We're looking forward to your submissions.

— Beth Schultz
Editor, Signature Series
bschultz@nwfusion.com



Message Queue

ANOTHER ASPECT OF QoS

It was refreshing to see and take part in such a lively debate on the best way to handle quality of service (QoS) on multiservice networks (www.nwfusion.com, DocFinder: 4225). One interesting topic the forum did not tackle is the question of who should own the QoS function — customers or service providers?

In just a few short years, we've come a long way in our ability to assure applications perform as needed across corporate networks. Using QoS technologies, enterprise IT managers can make sure that voice over IP doesn't get sidelined by HTTP — without reserving precious bandwidth to do so.

They can ferret out poor utilization issues such as NetBIOS sessions that are causing serious bandwidth strain — and take corrective action.

Using more advanced, WAN-based QoS technologies, IT staffs can even ensure bandwidth is always utilized to its fullest by invoking QoS policies only when network congestion strikes, and allowing all traffic to run free and clear at non-congested times.

These achievements have allowed organizations to save thousands of dollars by slimming costly overseas links and avoiding bandwidth upgrades.

What's the next step? Service providers must deploy the best QoS technologies and use them to turn on differentiated services. Think about it: Your IP service provider could offer application QoS — dedicated bandwidth and guaranteed predictability for specific applications.

You could define a minimum committed information rate for a specific application to ensure business-critical applications run smoothly between sites. You could get an application service-level agreement for SAP — and have a means to check up, in real time, whether that SLA is being met. You could order up IP tunnels with application awareness and assigned bandwidth guarantees.

If differentiated services and better QoS are a

part of the future you want your service providers to deliver, let them know.

Kit Waugh
Vice president, marketing
and business development
NetReality
Santa Clara

MANAGING RELATIONSHIPS

"Key communicators" (www.nwfusion.com, DocFinder: 4226) is one of the best articles that I have seen in a long time. As corporations move toward business-driven organizations, the role of the relationship manager will become critical. I have been performing this role for more than 10 years and have received a continuous stream of positive feedback from the business community and IT.

The real danger to the individuals who hold this position is the threat they pose to IT senior management. CIOs and their inner circle grew up managing applications that involve tangible generalities, whereas the relationship manager's job revolves around the intangible details. This makes the role of the relationship manager seem uncontrollable and therefore unmeasurable.

Rick Cowens
Indianapolis

FEELING UNSECURED

I couldn't agree more with your article "Internet Security Systems checks for wireless LAN vulnerabilities" (www.nwfusion.com, DocFinder: 4227). I have a 3Com Home Wireless Gateway with an Orinoco wireless PCMCIA card for my laptop. While I am able to reset my server-set ID to another code, my wireless access is screwed up when I try to turn on encryption; all the IP addresses become a jumbled mess. 3Com's support site is awful. Its articles are useless, and do not provide any means of live, telephone support.

Right now I'm hoping that hackers don't drive by my house with a scanning laptop to discover my unsecure access point, since on the other side of my DSL line is the corporate network. I'm sure my employer would not be happy with my setup.

Steve Young
Santa Clara

E-mail letters to jdix@nwfusion.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

www.nwfusion.com

MORE ONLINE

Find out what readers are saying about these and other topics.

DocFinder
4224
find it online



THE TREND TOWARD OUTSOURCING COMMUNICATIONS SERVICES

Today's corporate communications services have produced incredible improvements in industrial productivity. However, the cost of procuring and deploying these services is rapidly becoming one of the most expensive and complex areas companies must handle. Voice and data services typically cost \$2,400 to \$4,800 per employee, per year. Leading corporations would be paralyzed without electronic commerce, e-mail, online customer support, telecommuters and a mobile salesforce, but there is a growing need to more effectively manage and simplify these essentials.

While communications services are a significant and fast-growing cost of conducting business, they are only just beginning to be looked at in the same way as companies have long looked at managing other parts of their businesses. Corporations now must support not only telephone traffic, but also voice and data traffic coming in from a number of sources — laptops, PDAs and e-mail devices. Every stage of the procurement process, from ordering to installation to billing, requires companies to manage numerous steps, such

as researching service options and dealing with hundreds of contracts and invoices. This process is expensive and diverts in-house resources away from a company's core business. As a result, many companies are deciding to outsource their communications services.

The outsourcing that has taken place in the IT world provides a good model. As IT demands have exploded, many departments are assessing the application service provider model, which takes into consideration the scarcity and expense of IT staff, the need to deploy applications rapidly and the need to keep the company focused on its core business.

These same forces are driving a similar strategy for dealing with communications services. QuantumShift, a start-up in which Mayfield has invested, provides a single point for procurement and management of telecommunications services to midsize and growing companies. This approach has a number of advantages. Services for a distributed, geographically dispersed operation can be ordered and then quickly imple-



mented from a computer at a central location. QuantumShift provides a single source for procuring best-of-breed voice, data and Internet communications from leading service providers. And the company's Web-based platform lets companies point and click to add, move or change voice and data services, and to receive detailed online

billing information down to the individual-user level.

Look for other start-ups to begin offering one-stop shopping for managed communications services. The big carriers are also working toward providing single-source procurement with one master bill. However, it may be difficult for these established players to provide the best-of-breed services and outsourcing capabilities that customers need. Managers would do well to look at the QuantumShift model as a way to get the best services from the best providers.

Brooks is a general partner with Mayfield Fund, a venture capital firm in Menlo Park, Calif. He can be reached at tbrooks@mayfield.com.

IPv6: THIS IS YOUR WAKE-UP CALL

Recent IPv6 announcements from Cisco and NEC America won't have a dramatic impact on the U.S. network market this year. U.S. demand for IPv6 is small, primarily driven by early adopters and developers of third-generation mobile systems. However, commercial availability of IPv6 routing code from the leading router maker and hardware-based support for IPv6 from any vendor in the U.S. is significant. These

announcements are a wake-up call to enterprise IT managers and service providers, particularly those with business operations or partners outside the U.S. IPv6 is real and is happening now.

U.S. network managers have largely ignored IPv6.

Equipped with IPv4 addresses, network address translation and Classless Inter-Domain Routing, corporations and service providers have had little incentive to investigate IPv6. However, if U.S. multinational corporations and service providers want to participate in the global economy, they must begin taking IPv6 seriously.

For much of the rest of the world, IPv4 is too little, too late. There aren't enough IPv4 addresses to meet the needs of countries in Asia, South America and Africa, particularly if we factor in the growing demand for wireless devices, such as cell phones and PDAs. As a result, momentum for IPv6 is building worldwide. The governments of Japan, Korea and China have announced plans for large-scale IPv6 deployment. In Japan, several service providers offer commercial IPv6 services, and equipment makers

such as NEC have been shipping IPv6 products in Japan for some time.

Another indicator of growing interest in IPv6 is the number of conferences held on the topic. During the past six months, IPv6 "global summits" have been held in Japan and Spain. Another kicks off this week in Canada, while another is slated for July in Korea.

Here in the States, Seattle's Zama Networks (www.zama.net) this spring became the first U.S. service provider (of which I'm aware) to offer commercial IPv6 services. Zama initially is focusing on serving traffic between North America and the Asia-Pacific region, and recently brought up a node in Tokyo. In March, the company launched SmarterKit, which includes access to Zama's native IPv6 backbone network as well as consulting services. From the Zama network, customers can access the 6bone and other IPv6-based networks worldwide. Not surprisingly, Zama is testing IPv6 gear from NEC, among other vendors.

Cisco and NEC's announcements are noteworthy because they are among the first IPv6 offerings from hardware vendors targeted to the enterprise market as well as service providers. Most of the commercially available IPv6 implementations have come from Unix vendors, including Compaq, Hewlett-Packard, IBM and Sun. (Microsoft, although heavily involved in IPv6 development, offers only a prerelease version of its IPv6 code aimed at developers; Redmond has not announced a delivery schedule for commercial code.)

Cisco's IPv6 support in release 12.2(1)T of its IOS code represents the first in a series of rollouts of v6 capabilities. In this first phase, users of most Cisco routers (the 12000 and 7600 families excepted) can

deploy IPv6 as soon as they upgrade to the new IOS release. Cisco supports IPv6 in software only at this time, and has not disclosed when hardware support will be available. The lack of hardware support could slow deployment of Cisco's gear in production environments concerned about performance. However, it shouldn't affect customers looking to test the IPv6 waters.

In contrast, NEC in the next few months will roll out a family of Layer 2/Layer 3 switches and routers with hardware-based support for IPv6 and IPv4. Products in the family range from a multiservice switch router positioned for use at the LAN/WAN boundary (including Ethernet, packet over SONET, ATM, frame relay and circuit emulation service interfaces) to pure Ethernet-based backbone and edge switches. NEC is targeting companies and service providers with these products.

Clearly, a lack of products is no longer an excuse for ignoring IPv6. Enterprise IT managers and service providers need to realize that deployment of IPv6 isn't a matter of "if" but "when." Network managers should begin investing in IPv6 education and training now to develop a strategy. Multinational organizations should be aware of the IPv6 activities in the countries in which they operate — particularly the Asian continent, where the commitment to IPv6 is strong.

For organizations that operate in the U.S. only, IPv4 will be all they need for the foreseeable future. For the rest of you, this is your wake-up call.

Petrosky is an independent technology analyst in San Mateo, Calif. She can be reached at mary@mpetrosky.com.



When can you get the latest scoop on the winners and losers in 2001?



The Networked World webcasts are available on demand.

That means 24x7. Every minute, every hour, every day you now have access to the hottest, most current IT information available anywhere. The Networked World webcasts enable you to get up to speed on a variety of IT topics quickly and efficiently all from the convenience of your desktop.

Every month *Network World's* renowned Editorial Director, John Gallant, cuts through the latest hype in today's connected world and tells you what's real. Each informative webcast features lively debates between John and some of the industry's leading authorities. Participate in a live event and let John

and his guests know what you really think by asking questions and directing comments to them during the live Q&A session. It's a great opportunity to discuss the hottest networking topics with today's top experts. The Networked World webcasts also feature segments from key *Network World* editorial contributors like Paul McNamara and Mark Gibbs.

To view any of the Networked World webcasts on demand or register for the next live event, please visit www.itworld.com/itwebcast/nww today.

Tune in and stay on top of the technology affecting your business — anytime.

THIS MONTH'S FEATURED ON-DEMAND WEBCAST

■ The Winners and Losers in 2001

We survived the Y2K scare, but 2001 might prove to be scarier. With the spectre of a recession looming and a potential slowdown in IT spending, which companies will wither and which will prosper in the year ahead? Find out in this special webcast complement to *Network World's* NW 200 Issue which covers the industry landscape.

ALSO AVAILABLE ON DEMAND

- **Voice-Over-IP:**
Can it live up to the hype?
- **Win2K Migration:**
Is it time for you to move to Windows 2000?
- **Remote Access:**
Will broadband wireless become a real contender?
- **Network and Systems Management:**
Is the framework dead?
- **Converged Networks:**
Are you ready for digital utility?
- **A LAN of Its Own:**
Do you really need a separate storage-area network?
- **Active Directory vs. Novell Directory Services**
- **Big Bandwidth vs. Smart Bandwidth**
- **Hacking Back**
- **Microsoft:**
The Penalty Phase
- **Application Service Providers**

PRODUCED BY:

NetworkWorld

IT world.com
changing the way you view IT

www.itworld.com/itwebcast/nww

Feature

FIRE UP YOUR IT CAREER!

Spending less time managing networks and more time managing relationships with outsourcers and upper managers? Need to bone up on nontechnical skills like negotiating and presenting? Here's a two-year study guide.

IN TWO YEARS OR LESS

BY STEVE ULFELDER

WHEN JOHN PHAM WAS HIRED at Autobytel.com three years ago, he was a senior network engineer. Little did he realize that some of the most important skills required for his job might have nothing to do with technology.

For example, Pham is currently investigating voice over IP, which has made him an expert in the fine art of manure detection.

"My skills at negotiating with vendors have definitely increased," says Pham, who is now network operations manager at the online auto seller. "In [voice over IP], vendors are struggling to put together solutions. They give you the 30,000-foot view, but when you get down to detail, they get very sketchy."

What's the big lesson from all this negotiating? "You learn to tell when they're telling the truth."

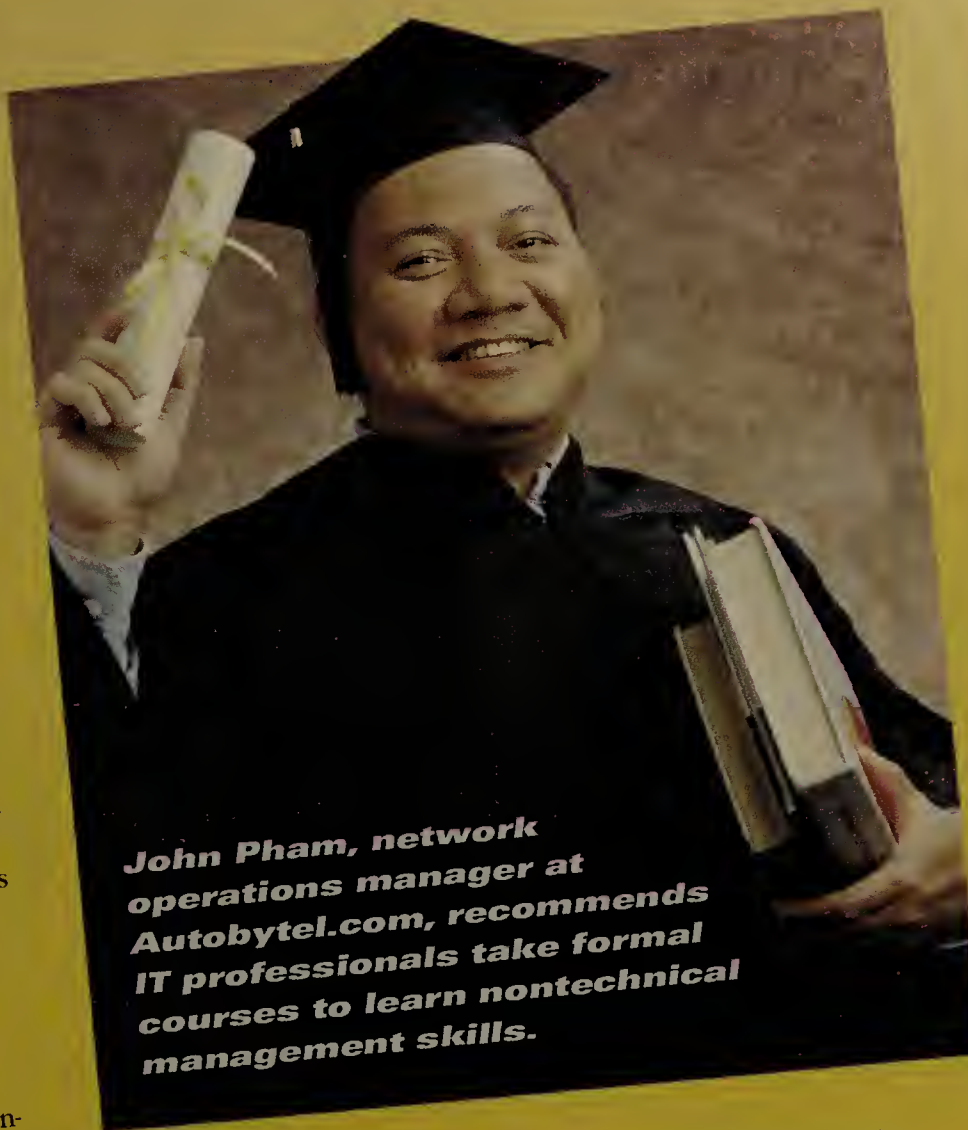
Like most network professionals, Pham's nontechnical skills are self-taught. But he believes that needs to change. He says he would "definitely advise a college course" for others following in his footsteps. "It's always nice to learn from others' mistakes."

In the future, network managers and executives will do less wrestling with routers and switches, and more wrestling with contracts, outsourcers and top business executives.

Whether managing contracts with ISPs, application service providers, carriers, outsourcers, systems integrators and consultants, going before senior management to make a case for a project, or managing complex projects that require cross-departmental cooperation, the demands of the job are changing.

It's not that technology expertise is unappreciated. To the contrary, those skills are jealously guarded by employers. For this reason, companies would rather help technologists gain business expertise than help business executives learn networking.

The problem is that "technologists in general have been siloed from the business. Now the time is right to break down the silos," says P.J.



John Pham, network operations manager at Autobytel.com, recommends IT professionals take formal courses to learn nontechnical management skills.

Guinan, faculty director of the Entrepreneurial Leadership Development Consortium for IT Professionals at Babson College in Wellesley, Mass.

To help you prepare for a silo-free world, we asked network professionals, corporate trainers, academics and other experts to help us formulate a two-year game plan.

Open matchbook cover (next page) for details.

STRIKE TO IGNITE CAREER

YEAR ONE CORE CURRICULUM

Business and Communication 101

When it comes to helping businesspeople grasp the value and risks of technology initiatives, "Those of us on the IT side need to realize the burden of communicating technology issues is on us," says Tim Peacock, vice president of development at service provider Intranets.com in Woburn, Mass.

The McCombs School of Business at the University of Texas at Austin features an optional Information Management concentration that enjoys a reputation as one of the nation's top techno-MBA programs.

According to Tim Ruefli, director of the concentration, students come from all walks of life — and that's the way they like it. "We'll have someone who's been writing C++ for the past three years and someone else who's been a dance instructor," Ruefli says.

First-year MBA students are immediately broken into study groups in which the techies are blended with the nontechnies. The point, Ruefli says, is to encourage communication.

And experts agree that the ability to discuss technology with laypeople is one of the first two things network pros should learn as they seek to increase their value. Paula Hinchliffe, network administrator at Seal Master in Kent, Ohio, may be putting it a bit strongly when she says her colleagues are often perceived as "just a bunch of noncommunicative freaks." The

stereotype may not be accurate, but it exists.

At the University of Texas, the techno-MBA program includes a simple way to address the problem: If a student with a technical background answers a question during class, Ruefli says, "we'll turn to a nontechnical person and ask if they understood the answer. If they say

no, we'll make [the original answerer] do it again." By the end of the first semester, he says, this approach succeeds. The technologists learn how to speak in terms everybody can understand, and the nontechnies learn more about IT.

There are plenty of resources available for networking professionals who seek to better connect with businesspeople and customers. Global Knowledge, an IT education company in Cary, N.C., offers a course called

Customer Communication Skills for IT Professionals. George Proudfoot, a Global Knowledge product director, says the company added the course when "we heard from our client companies that their IT pros had a tough time communicating with internal customers."

Some network professionals eschew formal training and instead rely on common sense when it comes to addressing business executives. When Hinch-

Public speaking basics

To advance your employer's interests while giving your career a big boost, many experts advise media training and/or lessons in public speaking.

Merely mentioning public speaking raises hives for many network professionals — even those who've successfully climbed the corporate ladder. "I've been a network engineer since the early '80s and I still can't stand speaking in front of large groups," says Ralph Jenson, CTO at Aravox Technologies, an Arden Hills, Minn., company that makes firewalls for voice-over-IP networks. "But if you give me a whiteboard and let me talk technology, I'm OK."

Media training used to be reserved for top corporate officers. But according to Steve Bennett, principal of Media Mentor, a Cambridge, Mass., consultancy, that's changed dramatically over the past several years. "We're seeing a lot more network administrators," he says. "People who've been in the trenches need the training, because there's nothing in their daily job that prepares them" for presenting before large groups or dealing with journalists.

According to Bennett, network professionals commonly need help in two areas: They tend to give too much information, and they use technical jargon that often goes over reporters' heads. With plain-talking technologists clearly at a premium, getting a few

liffe had to explain the benefits of an outsourcing arrangement to senior management, she reports: "I said, 'OK, you're building a golf course. You can either have Jack Nicklaus come in and design it, or you can design it yourself. Which do you think is going to come out better?'"

Of course, it also helps to speak the language of business. For that reason, you need a working knowledge of business terms and economics. Chances are, you've already picked up at least a basic understanding of the economic laws that make business run. But if you haven't, you may need to find a book or a Web site and play some catch-up.

Introduction to project management

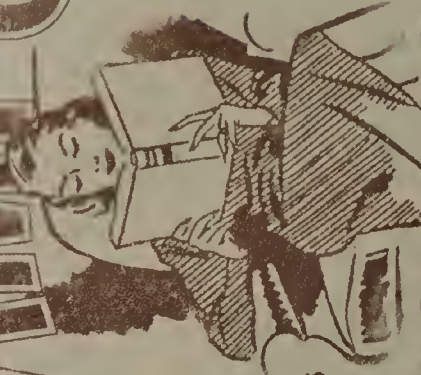
Project management goes hand in hand with communications skills, and many experts say it's a key development area for many IT pros. "Project management should come first," says Cushing Anderson, an analyst at IDC. "It's most important because it teaches technologists about the inter-relatedness of their department" with the overall business.

Some IT-education companies, including Global Knowledge, offer project management courses geared specifically toward technology professionals.

pointers in handling the media or public speaking can really enhance your career prospects. Most businesses still don't offer such training to the rank and file, Bennett says; if you want in, talk with your corporate communications department.

Full-fledged media training may not be a realistic option for everybody, but Toastmasters International is. The grass-roots organization devoted to public-speaking practice boasts of more than 8,000 branches worldwide and costs only \$36 per year (more information is available at www.toastmasters.org). "I wish I'd gotten involved with Toastmasters," Aravox's Jenson says. In the future, he says, "the greatest advantage in networking will be the ability to think fast on your feet, because you'll be doing a lot more presentations at customer sites."

CAMPUS

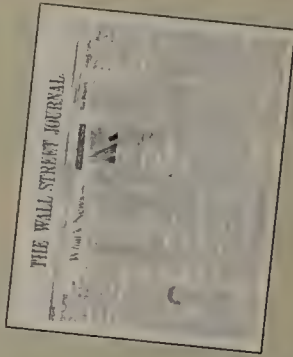


Always Open

BOOKSTORE READING LIST

The Wall Street Journal.

Sure it's a time sink, and it's hard to see how some of those offbeat stories about Peruvian cockroach circuses are relevant to your career. But every expert interviewed for this story, when asked what technologists should read to broaden their horizons, immediately mentioned *The Journal*.



Managing Up: 59 Ways to Build a Career-Advancing Relationship with Your Boss,

by Michael S. Dobson and Deborah Singer Dobson. Amacom.

There are plenty of "how to live with a jerk boss by going behind his back" books out there. *Managing Up* is different because of its integrity; the book helps the reader focus on organizational goals, not skullduggery.

The Quick and Easy Way to Effective Speaking,

by Dale Carnegie. Pocket Books.

The world is full of books on public speaking, but this one, by the acknowledged master of the field, will boost your confidence with a very small time investment.



YEAR TWO CORE CURRICULUM

Negotiating



In the University of Texas' Information Management MBA concentration, "We have a negotiation course, but it's not required," Reufli says. "But it ought to be. It is our most popular elective."

Negotiating contracts with vendors, carriers and outsourcers is a key part of network managers' jobs today and will become even more important in the future, experts say. Most network professionals have learned to negotiate the same way they've learned many other "soft" skills — by observing others and making mistakes. But there are more formal options available, which may save you some painful lessons.

At the Babson College Entrepreneurial Leadership for IT Professionals program, which consists of two multiday sessions separated by several

weeks, Guinan says negotiating skills are saved for the latter, "down and dirty" sessions, during which students use role-playing, observed by instructors, to learn how business really works.

The good news is that most continuing-education programs offer a course in negotiation, as do IT-education specialists (see sidebar).

Social networking

Despite all our tips on formal training and educational programs, it's a fact of life that most learning is done on the job and on the fly. The benefits of the buddy system are well-documented — but it may not have occurred to many IT people to seek mentors and contacts outside the technology sphere.

"Very few people can say no if you come up and ask for guidance on moving your career forward," says Gary Kaplan, principal of the Pasadena, Calif., recruiting firm Gary

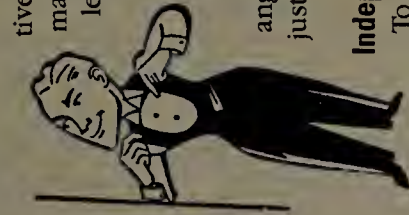
Kaplan and Associates. "A couple of times a week, you've got to get out with people — not networking people, but other folks in the organization. Management, HR, marketing. Have them become part of your Rolodex."

Toastmasters, the public-speaking group mentioned above, is another networking tool. While you're honing your



communication chops, you also meet local business-people.

You needn't force yourself to become a major-league backslapper, but being viewed as a well-rounded person with friends in all branches of the business, and even the local business community, can only help.



tives and lawyers, it's worth your while to make sure your wardrobe is up to the challenge. Fortunately, there are plenty of resources available (see list, right).

(ANSWER: According to dressforsuccess.com, "The pants in the front should touch the front of the shoe and angle toward the back of the shoe to fall just above the heel.")

Independent study

To MBA, or not to MBA? That question divided our expert panel. Most network managers agree that an advanced degree would be a terrific resume item — but isn't life busy enough? Aravox Technologies' Jensen sums it up when he says, "An MBA might not hurt, but it is a pretty big, time sink."

That it is, but others point out that most pro-

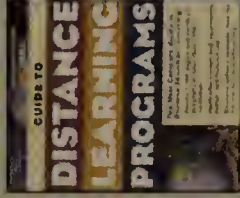
The Complete Idiot's Guide to MBA Basics, by Tom Gorman and Ed Paulson, Alpha Books.

Less expensive than a real MBA and faster to boot, this book is a good rough-and-ready guide to business terms.



Guide to Distance Learning Programs 2001 (Peterson's Guide to Distance Learning Programs, 5th Ed).

Why let geography limit your continuing education? Here's a comprehensive list of distance-learning programs.



The New Professional Image: From Business Casual to the Ultimate Power Look, by Susan Bixler and Nancy Nix-Rice, Adams.

Aimed at men and women alike, this highly regarded book can spiff up your look.



OTHER RESOURCES

Global Knowledge specializes in IT education and offers a new Business Technologist Certification: www.globalknowledge.com

Computerworld's ranking of the top schools for

techno-MBAs: www.computerworld.com/cwi/story/0,1199,NAV47_ST042377,00.html

ITworld.com's special report on negotiation:

www.itworld.com/Man/2701/ITW010402negotiation/

Wardrobe tips: www.dressforsuccess.com

Ulfelder is a freelance writer and can be reached at sulfelder@charternet.

Year Two extra credit


Fashion basics

Pop quiz: How long should your slacks be?

The answer's below, but if you said, "Short enough so that they don't get caught in my bicycle sprocket," you really need this extra-credit assignment.

IT pros have a reputation for being sartorially challenged. Fair or not, the image persists. If you and your colleagues do pay less attention to dress, it's because technology is a proud meritocracy in which the quality of people's ideas means more than the color of their socks.

Nevertheless, you're entering a world in which appearance matters. As your job changes to include more face time with business execu-



DO NOT INSTALL
*or even purchase any software
until you check out the new
Product Finder at ITworld.com.*

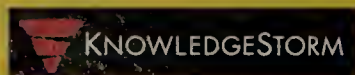
Webcasts

Editorial

Services

Want to really get noticed in your company? Just choose the wrong software.

At ITworld.com, our free Product Finder – powered by KnowledgeStorm – lets



you quickly evaluate more than 3,500 IT providers and 20,000 software and service solutions. So

you're sure to find the best solution for your company. Product Finder – one more way we're changing how you view IT.

Check out Product Finder at www.ITworld.knowledgestorm.com/search

Changing the way you view IT.

ITworld.com

ITcareers • LinuxWorld • JavaWorld • UNIX Insider
CIO • Computerworld • InfoWorld • Network World

an IDG
company

Protecting the hometfront

How to make the home office as secure as the main office.

BY STEVE JANSS

He waves to the office complex security guard at 6:13 a.m., rides the elevator to the second floor, and says hello to the secretary by name before popping into a nearby cubicle. After logging on with information gained earlier by posing as a help desk technician, he runs a program from his CD that scours your branch office network for various data files. He says goodbye to

the security guard at 6:27, and you say goodbye to your corporate secrets at 6:30.

Several months later, you're deep in the middle of a well-planned hostile takeover.

The moral of the story is don't think you're immune just because you're running a corporate firewall. Nor are your teleworkers immune just because they appear to be small targets — they may very well become the target

ILLUSTRATIONS: MICHELLE BARBERA

TELEWORKING TOP 10

An ongoing series designed to help set up your teleworkers for their small-office or home-office networks.

PART 3

PROTECTED
BY VPN

choice in the near future. If you don't want your teleworkers to be the weak link in your corporate security plan, you must take several key steps.

Audits aren't just for accountants...

The best and least expensive approach to prevent your teleworkers, mobile warriors and branch offices from becoming the weak link in your corporate security plan is to conduct a thorough security audit.

First, list all the physical and logical points of entry and interception used by hackers and viruses. Second, map out how well a variety of security products and operating system tweaks address each of the points. Third, evaluate your options based on their initial cost, installation cost, cost of upgrades, and maintenance cost over the typical PC life cycle, arriving at a total life-cycle cost. Finally, choose the mix of products that secures all points of entry while minimizing total cost.

Back to basics

But before you spend a fortune on the latest technology, spend some effort enforcing the basic rules of security. Your expensive security system will quickly succumb if your teleworkers are letting family members log onto the corporate VPN or running unauthorized software. While it's easy to control the activities of your corporate users through scripts and policies, doing the same for your teleworkers is significantly more challenging.

Review the corporate security policy. Teleworkers have specific needs and concerns, which should be addressed separately. Due to their vulnerable position, they may not be able to have access to the same assets as those working inside the corporate firewall.

It's a good idea to outline the corporation's right to secure its assets — some teleworkers can become rather possessive of the computer you provide them, simply because it's inside their home. Gently remind them that while the computer resides in their home, the corporation retains ownership. Ensure your teleworkers review and sign a copy of the policy.

Finally, educate your teleworkers. Impress upon them the consequences of downtime caused by not following the policy, and how it can affect the corporation as a whole, not to mention

■ Your expensive security system will quickly succumb if your teleworkers are letting family members log onto the corporate VPN or running unauthorized software.



the teleworker's ability to do their job.

Separate and isolate

If your teleworker has a dedicated workstation, lock it down before it leaves the IT shop. Cloning a well-tweaked Windows 2000 Professional reference machine for installs will ensure uniformity. Avoid naming the computer "CorporationX-101" — choose something a little less revealing, such as "WS-11435." If the teleworker has a high-speed connection and a VPN, consider having them log on to the corporate network so you can maintain their systems as if they were local.

Naturally, you can expect some of your teleworkers to resist your security policies. If the company provided them with a computer, however, remind them that it still owns the computer, as well as every information system accessed by that computer. The company has a right to protect its electronic assets. Fortunately, there are ways to soften this harsh reality.

One approach you could take is to sweeten the pot with free 24-7 high-speed Internet access for the family. Because cable modems average but an additional \$10 more than midlevel cable service, adding free cable TV will go a long way in the area of employee relations. It may seem contrary to teleworker efficiency to provide them with TV service. But if you don't provide it, nearly all employees will get cable on their own, anyway. The savvy company will foot the bill.

While you're securing a teleworker's workstation, place appropriate restrictions on their access to corporate files. Few teleworkers should ever have access to all corporate databases. Limiting their access will also limit access to anyone who breaches the teleworker's

security system.

Firewalls — building the barrier

Firewalls are a must, regardless of the type of Internet access. If you're running a distributed firewall, ensure its policies are similar to those used by your corporate users, and that it can receive policy updates through the VPN. The only differences in policies should be those required for remote access. Limit VPN to the teleworker's profile. Ensure the accounts created by your teleworker for friends and family do not have VPN access.

Distributed firewalls are one of the more intriguing offerings. These software firewalls reside on every workstation and laptop, and synchronize with the policies dictated by the corporation's main firewall when connected directly to the LAN or via the Internet through a VPN.

Check Point Software's offerings are beginning to mature, and the company offers one of the most comprehensive sets of security solutions for corporate environments. When integrated, its Firewall-1, VPN-1, and VPN-1 Secure Remote provide a comprehensive, centrally-managed security solution. The VPN works with the firewall. If it detects evidence of tampering in the firewall's rule set, it refuses the VPN session.

Another outstanding offering is Sygate's Enterprise Network, which won a Blue Ribbon Award in our review of personal firewalls last year. While it doesn't have quite the feature set of Check Point's product line, it's a secure, low-cost, centrally-managed system ideally suited for smaller firms with mobile workers and teleworkers.

If your teleworkers connect via cable modem or DSL, spend the extra \$150 for a good cable modem/DSL firewall such as LinkSys's BEFSR41.

Their latest firmware allows IP Security passthrough, and the unit's four ports also let other family members use it. NetGear's FR314 ups the ante by providing stateful packet inspection in addition to network address translation, along with Internet access filtering to ease parental worry by blocking content unsuitable for kids, as does SOHOware's BroadGuard.

If they're one of the few connecting

via ISDN, satellite or wireless, you may be able to use this type of device, depending on the connection setup. If you choose to offer this benefit to your teleworker, protect their machine from family members with a distributed firewall or a good stand-alone software firewall such as ZoneAlarm or Symantec's Desktop Firewall.

VPNs — securing the data stream

Securing remote workers isn't easy — dedicated lines such as T-1 and frame relay are too expensive, and dial-up is too slow. Broadband is fast, but it's not secure.

While some cable modem companies still use hubs for their customers, others, such as Cox Communications, use router-based connections to eliminate IP broadcasts and stop network browsing. Still, any Web site you surf knows your IP address, and that's all a hacker needs.

On the Internet, you never know who's listening. Anyone with the right equipment and physical access somewhere along the datastream can eavesdrop. You should take the same care to protect your teleworker's datastream that you take to secure your Web site's electronic transactions.

Unless you encrypt your teleworker's data using a VPN, that data, including e-mail, is open to eavesdroppers. If all your teleworker does is write "how-to" articles, a VPN may be overkill. If they e-mail confidential information, consider using an e-mail encryption system, such as Pretty Good Privacy. But if they regularly access a corporate database, a VPN is mandatory.

The question is "which VPN?" There are too many vendors and variables to list here. However, *Network World's* hardware VPNs (see graphic, below) are two great places to start. You may even have VPN capabilities built into your current corporate router.

Unless you're running the latest distributed firewall technology, encrypting everything on your LAN, and using VPNs for all external connections, you're a target for hackers — especially if your corporation has branch offices, mobile warriors and teleworkers. Taking the appropriate steps to secure your network beyond the edge requires some careful planning, but is well worth the effort.

Besides, you'll sleep better at night — and so will your boss.

Next article: Teleworker support — Who to call when things go wrong, and how to prevent most problems from happening in the first place.

Janss is the president of Jansys Information Systems, a consulting firm specializing in IS technologies for small businesses. He can be reached at bizcom@jansys.com

Online resources

Vendors:

Check Point: www.checkpoint.com
Sygate: www.sygate.com
SOHOware: www.sohoware.com

LinkSys: www.linksys.com

ZoneAlarm: www.zonealarm.com

Symantec: www.symantec.com

Pretty Good Privacy: www.pgp.com

Articles

Network World VPN hardware: www.nwfusion.com/reviews/2000/1211rev.html

Network World VPN software: www.nwfusion.com/reviews/2001/0312rev2.html

Put your company's video content professionals back behind their cameras where they belong.

Producing corporate video content for the Web is a bit easier than it was in the mid-1990s, when streaming media was first introduced as a desktop application. But now expectations are high. Your company's marketing and corporate communications staffs have tons of messages they want to enhance with video, and they want it done yesterday. Meanwhile, your audience members (end users) all want to see MTV-quality on their desktops.

Despite what Jeff Goldblum will have you believe in Apple's iMac/iMovie commercials, there are some difficult steps in the media production process. Publishing to a streaming-media content delivery network for global reach, for example, is fraught with conflicting and complicated path names. And resource bottlenecks remain.

One of the bottlenecks is converting digital video/audio media from one format — a high-quality, low-compressed or uncompressed original, (such as from a digital video editing system) — to another format suitable for IP-based streaming (or from one format to multiple data rates and formats). Industry-leading solutions for performing these conversions (most notably Media 100's Cleaner Pro and Avid's ePublisher) are designed for a dedicated video producer's workstation and have many sophisticated features that require considerable training. The same person who edits, titles and "polishes" the content to meet corporate communications guidelines typically will be involved in the conversion to Web-ready/streaming format (also known as encoding).

Many media professionals spend hours bent over a keyboard and mouse in an editing bay, followed by more hours at a terminal managing the intelligent compression of the media to its optimum viewing experience. Once the settings are known, a consistent video experience may be obtained by reusing the same parameters. Those who work with video content as just another means to an end — communicating — can now avoid learning all the nuances associated with compressing in different data formats and data rates.

Telestream's FlipFactory Publish 1.1 is server-based software so simple that anyone with a Web browser can use it, yet so powerful that enterprise content professionals can trust it to consistently publish video for the Web. If you're an IT administrator, you'll like FlipFactory because it's Windows server-friendly, and has

Flipping for FlipFactory

Telestream software makes multimedia file conversion a breeze.

BY CHRISTINE PEREY,
NETWORK WORLD GLOBAL TEST ALLIANCE

a light footprint and secure access through password protection — and the price is right, too.

Keeping it simple

We were impressed with how FlipFactory simplified media conversion in different scenarios. A set of wizards lets you establish a publishing workflow. In each step, FlipFactory eliminates irrelevant options and forces the selection of key parameters when you create media "factories."

Factories consist of encoders and destinations. Encoders are possibly the most complicated element, but Telestream lets you choose from a half-dozen data rates, and at least 10 video and audio coder/decoders, via pop-up menus. The categories that need to be selected are based on the outcome the user wants and the for-

mat of the file the encoder begins with. FlipFactory's encoders can begin with practically any digital source: from a broadcast-quality file on a media server (usually in MPEG); an archive in a streaming format such as Real's .rm or Microsoft's .asf; to advanced authoring or editing languages (such as Avid's); or digital video, a digital capture format used in semiprofessional cameras. Once the encoders are created, the end user no longer sees all the options. An account may have an unlimited number of encoders, but going too far down this path increases complexity and defeats the purpose of FlipFactory Publish. The important parameter for success is to have filters set, if necessary, and the correct encoders for a particular destination or application.

Destinations — the task you want the software to perform following the compression or transcoding — are

even easier than encoders to set up. Your options include keeping the results on the local server, e-mailing the results to the account contact (or anyone else), or automatically pushing the files to a server (or servers) via FTP.

Factories can produce as many "products" (defined by Telestream as one encoder and one destination) as needed. We found it was difficult to manage more than four products in one factory, because each product needed a nickname and keeping them straight required a naming scheme. When submitting a file to a factory, we could FTP the file from another server or e-mail the original as an attachment to FlipFactory's automated e-mail client. Although we didn't test this second option, it could be an important way to prioritize bandwidth around a server: Those with urgent needs could be authorized to transfer a file for immediate conversion, while lower-priority requests could be sent via e-mail and held in a queue.

For users managing factories from a Web browser, Telestream offers a number of preprocessing options. Although the impact of processing cannot be previewed in the system, any preprocessing that might need to be done on media (such as deinterlacing/interlacing, frame rate conversion, temporal or spatial interpolation, color correction or watermarking) is performed automatically before a factory begins its task. Preprocessing filters could add value to the users of Telestream's technologies beyond the desktop "personal" media conversion products, similar to how Kai's image filters added value to Adobe's Photoshop.

Installation

FlipFactory comes on a CD, but can also be downloaded from Telestream's Web site. The software doesn't require a high-end server to operate, but if you're going to create accounts for more than a few simultaneous users, Telestream recommends at least dual Pentium III Xeon processors, 2M bytes of Level 2 cache and 512M bytes of RAM. As long as you've got Microsoft's Internet Information Server, installation is trivial. An installation wizard (a new feature in Version 1.1) helps you selectively install program options if you want more than the Flip Engine and default components. For example, the package comes with what it calls base-level encoding and decoding formats. These are popular formats, such as Real Media, QuickTime, Windows Media, MP3 Audio and WAV Audio. All are the original manufacturer codecs available at no charge from the respective manufacturers'

NetResults

FlipFactory Publish 1.1

RATING: 4.35 **COMPANY:** Telestream, (877) 257-6245, www.telestream.net. **COST:** \$10,000 per server; \$1,750 required maintenance and support fee; MPEG output option (MPEG-1, MPEG-2 and DV), \$4,500 per server. **PROS:** Easy to install; easy to use; good cost compared to single-user and other solutions. **CONS:** Performs essential but limited tasks; use in large multi-server network could be prone to human data entry errors.

	Features/ ease of use 40%	Stability, security and administration 25%	Installation 15%	Support and documentation 10%	Price 10%	Total score
FlipFactory	5	4	3	4	5	4.35

Scoring Key: 5: Exceptional showing in this category. Couldn't be better. May define the standard for excellence in this category. 4: A very good showing in this category. Although there may have been room for improvement, this product was much better than average. 3: An average showing in this category. The product was neither especially good nor exceptionally bad. 2: A below-average showing in this category. The product lacked some features or had lower performance than other products, or than was expected from a product in this category. 1: Considerably subpar, or lacking features being reviewed. A 1 is the lowest score that can be awarded.

Web sites, but Telestream made it convenient for administrators by including them. Additional broadcast-specific encoders and decoder options include proprietary technologies Telestream licenses or has written for use with FlipFactory, such as DV Encoder, MPEG1 System Stream and several MPEG2 Program Streams (up to 50M bit/sec).

The program also includes the Microsoft Data Engine, a minimal version of SQL Server 7, that FlipFactory uses as its database.

Stability, security and administration

We were concerned the product didn't behave consistently in diverse client environments. For example, the console display and operation appeared different on two networked clients we tested.

On the system set to display large fonts, each time we selected options from pop-up/drop-down menus, the frame would anchor back at the top of browser window, creating the need to scroll down to the next setting in situations where the number of options was longer than appeared on the first screen. When we created a new encoder, destination or factory in either client, the cursor did not default to any particular field, requiring an extra step to point and click when creating a text insertion point.

Another risk with a server-based application is it could be used by

someone other than the account's owner to perform unnecessary tasks or to send media to destinations outside the corporation without authorization. When users connect to the Flip Engine, they see a logon and password page. Once their user name has been accepted, they will see only the details of their account. FlipFactory's console session remains active as long as the user is making requests, but the session

logon name and password field when creating a destination.

Because many people can use the server-based FlipFactory at the same time (there is no limit to the number of accounts that can be created), each account has uniquely defined encoders, destinations and factories. For example, from the destinations interface, you can create, modify or delete a destination. Modifications are contingent on an element not being in use by any other factory. When we used an encoder in one factory, the database detected its use and prevented us from changing the parameters on the codec. Unfortunately, it failed to offer a solution for releasing the encoder from its factory.

Performing administrative tasks on the server running FlipFactory is relatively routine. Detailed log files are available, and any errors that occur during a particu-

lar step are noted. Also, the server's automated status messages can be e-mailed to the user or to others, as well as to a LAN administrator.

Support and documentation

Telestream's technical support team was helpful during product testing and provided valuable insights into underlying technology. This said, consulting on multimedia network design is outside the company's scope. Given the company's product and the range of possible implementation scenarios involving caching servers, firewalls and proxies, these questions will probably come up, and a \$1,750 maintenance and support agreement is required with each server software license sold.

The documentation is well-written and comprehensive. Online help is included on the server. Product and documentation are not available in other languages, and the company doesn't have plans to offer non-English versions.

The price is right

FlipFactory Publish software costs \$10,000 per server (recently reduced from \$19,500). Telestream charges extra for professional output format options (MPEG1, MPEG2 and DV). A \$5,000 enterprise integration package provides software APIs for database submission of jobs. New companion products using the firm's proprietary MDML, the Media Delivery Protocol (which controls, negotiates and monitors media delivery) and Flip Engine are expected later this year. Even at this price, the benefit of enabling dozens of dispersed



FlipFactory made it easy to convert media in different scenarios.

expired after 20 minutes of inactivity. This is an important security feature, but in one case we lost some work because the changes to the database were not saved.

Also, the destination creation process could be improved. When we chose a destination that was on the same or another local server, it only let us type in a host name and path to a specific directory. Offering a "browse to" button (found in most application interfaces) would reduce human error. Furthermore, because most servers are secured against user tampering, it makes sense to have a

files, provided by Telestream for this test, included an 8M bit/sec MPEG2 file approximately 30 seconds long and a 1.5M bit/sec MPEG1 file approximately 15 seconds long. Using FlipFactory, we created new files in RealVideo and Windows Media formats and flipped these further. In one scenario we pointed the factory to the file located on the corporate network and asked Flip Server to leave the four outputs (RealVideo G2 at 20K bit/sec for streaming over dial-up modem connections; RealVideo G2 at 68K bit/sec for higher connections; Windows Media Video Version 7; and Audio Version 7 at 20K bit/sec and 80K bit/sec, respectively) on the transcoding server for FTP download. In other scenarios, we requested that the resulting files be returned to the account's owner by e-mail and placed in a specific directory of a second, high-capacity hard drive on the server.

www.nwfusion.com

WEB ENCODING

Find out online why video-encoding services haven't made a big splash.

How we completed our testing.



(Intranet- or extranet-based) users to encode or transcode their own content for reuse in specific streaming applications on a common platform will produce a positive return on investment.

Conclusion

While you shouldn't give everyone a video camera, abandon all personal video-encoding stations and issue hundreds of accounts for automatically publishing video to any Web site. FlipFactory can reduce the headaches that come from performing time-consuming, delicate but repetitive tasks. The feature set and cost makes this product a good value for companies that plan to have more than 20 people around the globe produce an aggregate of more than four hours of new all-digital content each day. With FlipFactory Publish, you can save some time for your users who review and approve corporate content.

Perey, who is president of Perey Research & Consulting in Placerville, Calif., can be reached at cperey@perey.com.

How we did it

We installed FlipFactory Publish Version 1.1 software on our Dell PowerEdge 1400 server (dual 1-GHz Intel Pentium III processors and 1G byte of RAM) running Windows 2000 Professional Server. Installation included support for server playback of RealNetworks' RealSystem and Apple QuickTime file formats. Microsoft Windows Media Technology support is included in all Win 2000 systems. The server was connected by an embedded Intel 10/100 network interface card to our 100M byte Ethernet LAN and accessible from any client on our campus network.

The testing scenarios simulated a company creating and distributing significant quantities (more than four hours) of video-rich training content, corporate communications and promotional content on a weekly basis to servers located in remote facilities globally. Original sample content



Perey is also a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.



Management

Strategies

Career Development, Project Management, Business Justification

The road to CCIE

Book learning takes a backseat to hands-on knowledge.

BY JEFF SHAPIRO

Wow, has it been a year already? It seems like just yesterday I started working on Cisco's top-level certification, the Cisco Certified Internetwork Expert. During the past year, I've learned my way from the basement (Cisco know-nothing) to the rooftop (Cisco Certified Network Professional), and I've already started hiking toward the mountain peak (CCIE). I was hoping to make it to the top in September, but early December is looking more likely. What a Christmas present to myself.

I finished the exams necessary for the CCNP certification at the end of last quarter. The four exams seemed to get easier as I went along. But from here on, it gets much harder. The CCIE exam is actually two parts: the written qualification exam and the two-day-long, hands-on practical exam.

Up to this point, most of my work was theoretical. My hands-on experience with many of the devices covered by the exams was limited, mostly by lack of access. Still, studying, practicing where I could and using practice exams was effective.

Lean on Cisco

Here's a tip: The stuff you don't have you can borrow. My local Cisco office offered me access to a demonstration lab, and when I need to get familiar with bigger boxes, I'll take advantage of that. Cisco wants (and the industry needs) more CCIEs, so you'll find many Cisco offices are friendly to advanced students.

As you prepare for the CCNP exams, review the exam topics on Cisco's Web site at www.cisco.com/warp/public/10/wwtraining/certprog/testing/exam_list.htm. You'll know what to expect, and you'll see the way topics are presented. They're all action items, such as this one from the Routing exam: "Configure policy-based routing using route maps."

This indicates you need to be comfortable with policy-based routing, not just know the right commands to pass the exam. Yes, you could play Polly Parrot and probably pass, but would you have really learned anything useful? If you're not well-acquainted with the subject matter, you're going to find CCIE a huge and possibly insurmountable hurdle.

The past few months have been really different than what I expected. I knowingly took the shortest path to get the CCNP, but it would have been better to go the in-depth route first. I ended up with a lot of technical knowledge but little practical knowledge, which is absolutely essential for CCIE. Becoming a CCIE isn't only about technical knowledge; it's about familiarity and instinct.

As reader Scott Keoseyan (CCIE #5885) advised me, "In the final analysis, it's not about issuing a finite set of commands into a router that you can read in a manual somewhere.

Rather, it's all about knowing the protocols and topologies well enough to know what needs to be done on the router in a methodical, measured fashion. This is the mark of a CCIE. If you take this approach, I believe you're going to find that the road to CCIE is going to be smoother, but is also going to be a lot more satisfactory."

Learning, unlearning and relearning

I've now relearned almost everything I previously "knew," this time with emphasis on understanding and integrating all the parts of internetworking theory. Practice is tough.

I spend two to three hours an evening posing myself problems and then working with the limited equipment I have to solve those problems.



Soon I'll take the Cisco Voice Internetworking and Cisco ATM Networking classes at my home away from home, Global Knowledge Networks. Next, I'll work on getting comfortable with the new material, drilling and filling the gaps and focusing on the intricate stuff. I plan to take the written CCIE exam in September, then will spend the next two months practicing.

Finally, I'll be ready for the CCIE practical exam — two days of fear, sweat and concentration. I can't emphasize enough how different this phase is than what has come before.

From June 25 to 29, I'll be at Cisco's Networkers 2001 Los Angeles conference, an event I recommend for those who are serious about their careers as internetworking experts.

Say "howdy" if you see me there.

Shapiro is district technology coordinator for Kingsport City Schools in Tennessee. He can be reached at js Shapiro@kpt.k12.tn.us.

www.nwfusion.com


NET KNOWLEDGE

Refresher reading:
Parts 1-3 of Shapiro's certification quest.

Networkers: Cisco's annual user conference

find it **4230** online

CALL 703-339-2256 NOW FOR A PERSONALLY-GUIDED
ON-LINE GHEPARDO DEMO.


GHEPARDO
PROTOCOL
ANALYZER/
SERVER

*"I've increased customer retention
because I can see for myself if
LNP activation was successful!"*

SERVICE ACTIVATION REP

*"I'm in control because I can
see my entire network from
the Web! We're scooping up
money we never even
saw before."*

SS7 MANAGER

**SEEING IS BELIEVING. SEEING IS PROOF.
AND PROOF IS MONEY IN YOUR POCKET.**

**NOW YOU CAN GET CONTROL OF YOUR
REVENUES AND EXPENSES** – while you monitor your
network performance and troubleshoot from your favorite Web browser.

You'll keep new customers with real-time verification of Local
Number Portability (LNP) during service activation. You can cut
expenses by verifying all carrier access billing records. And you'll
have Call Detail Records (CDR) even when an overloaded switch has
stopped producing billing records. All of this while collecting normal call
statistic information, performing network direction traffic analysis, analyzing
signaling protocol issues, and managing network quality control.

The Ghepardo Protocol Analyzer/Server is Web- and
server-based, so up to 32 users can monitor, share the results
of four concurrent tests, and do surveillance simultaneously from
a single Ghepardo – with each user seeing a different customizable view.
To see even more, you can network up to 256 Ghepardos.

Register at www.sunrisetelecom.com
and we'll send you a free 24-page brochure.
Or call 888 242 7077, fax 408 360 1958,
or email order@sunrisetelecom.com.
And see what you've been missing.

*"I save on carrier access billings, and add
revenues with complete customer billing
records. The best CDR ever!"*

NETWORK OPS MANAGER


SUNRISE TELECOM
INCORPORATED
... a step ahead

Stay on top of IT with Rose KVM Switches!

KVM is the industry acronym for Keyboard-Video-Mouse. KVM switches save money and space in your server room or on your desktop. Rose is a pioneer and leading manufacturer of KVM products.



UltraMatrix™

2 - 4 - 8 - 16 users up to 1,000 computers

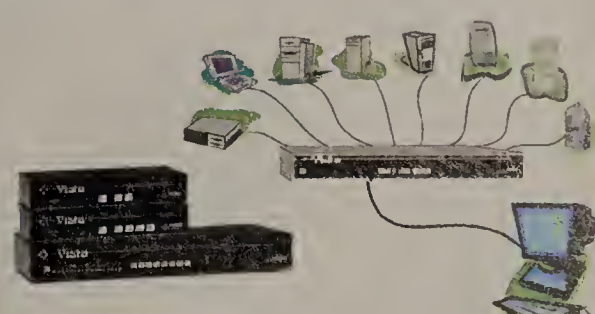
- ▶ Multi-platform for PC, Sun, RS6000, HP, DEC, SGI
- ▶ Advanced on-screen display technology
- ▶ Simple bus cabling makes expansion a breeze
- ▶ Switch computers from your keyboard or on-screen display
- ▶ Status screen shows system conditions at a glance
- ▶ Security features prevent unauthorized access
- ▶ Flash memory for free lifetime firmware upgrade
- ▶ Programmable view, share, control, and private modes



UltraView Pro™

1 user up to 256 computers

- ▶ Available in three different chassis sizes; either PC or multi-platform (PC, Unix, Sun, Apple)
- ▶ Advanced on-screen display technology
- ▶ Simple to use, keystrokes switch computers
- ▶ Flash memory for free lifetime upgrade of firmware.
- ▶ Supports up to 1600 x 1280 resolution
- ▶ Full emulation of keyboard and mouse functions
- ▶ Security features prevent unauthorized access
- ▶ Simplified cable management



Vista™

1 user to 2, 4, or 8 computers

- ▶ Low cost and easy to use
- ▶ Switch computers from front panel or keyboard
- ▶ Supports PC or PC/Apple
- ▶ Supports up to 1600 x 1280 resolution
- ▶ Plug and play
- ▶ Supports Microsoft intellimouse
- ▶ Tested with Windows 95/98, NT, Linux, and others

GET YOUR ROSE CATALOG TODAY



ROSE
ELECTRONICS

USA

10707 Stancliff Road Houston, Texas 77099
Phone 281-933-7673 Fax 281-933-0044

EUROPE

Bourne Works, High Street Collingbourne Ducis
Marlborough, Wiltshire, SN8 3EH United Kingdom
Phone: +44 126 485 0574 Fax: +44 126 485 0529

WWW.ROSEL.COM
800.333.9343

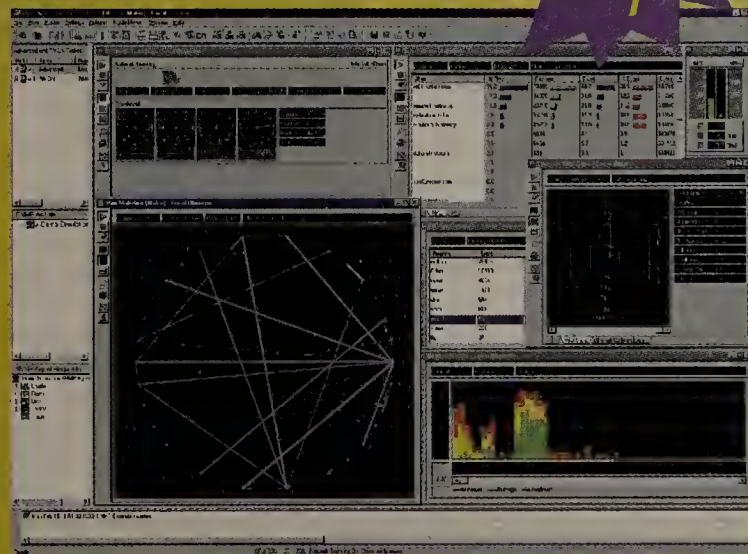


High Performance LAN/WAN Troubleshooting & Protocol Analysis Software Solutions

Observer—Removes the Mystery of What is Being Sent or Received by LAN Stations

Observer identifies network trouble spots and costs thousands less than expensive hardware-based analyzers. If you have any network problems, find out the cause with Observer, Expert Observer or Observer Suite.

- **Full packet capture and decode** for over 1000 protocols, including TCP/IP (v4 and v6), NetBIOS/NetBEUI, IPX/SPX, Appletalk, SNA and DECnet
- **Switched mode** sees all ports on a switch gathering statistics from an entire switch or packet capture from any port(s)
- **Long-term network trending** collects statistical data for days, weeks, months, even years
- **Optimized ErrorTrack NDIS drivers** display true errors-by-stations
- **Real-Time Statistics** include Top Talkers, Bandwidth, Protocol Statistics, Efficiency History



EXPERT OBSERVER® \$1895
OBSERVER® \$895
SUITE \$2995

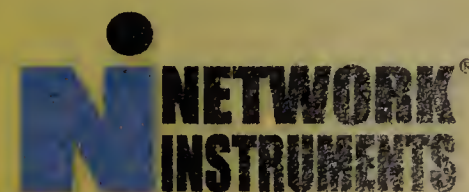
- **Additional probes** are \$295 per local or remote segment/site/switch
- **Ethernet (10/100/1000), Token Ring, FDDI**

Expert Observer—Identifies Problems and Provides Expert Information in Plain English

Expert Observer includes all of the features of Observer plus real-time and post-capture expert event identification, expert analysis, VoIP expert and modeling of network traffic data.

Observer Suite—The Ultimate Tool For The Most Demanding Power User

Observer Suite provides a full complement of tools that includes all of the features of Expert Observer plus SNMP management, RMON console/Probe and Web reporting. Includes one remote Probe.



Call 800-526-7919 or visit us online for a full-featured evaluation:
www.networkinstruments.com

US & Canada (952) 932-9899 • Fax (952) 932-9545 • UK & Europe +44 (0) 1322 303045 • Fax +44 (0) 1322 303056

When **network uptime**
is your life...



your **power management**
solution is your life saver.

Real life questions:

How much power is my equipment using?

Am I about to trip the circuit breaker?

What is the temperature of my cabinet?

How do I reboot locked servers from 5000 miles away?

Real life answers:

BayTech power management solutions with a return on investment that just makes sense.

You no longer need to be there to reboot locked routers, SNMP traps are generated when you reach your circuits capacity, and power measurement is instantaneous.

Reducing downtime and costs is no longer a luxury, its a requirement. With BayTech remote site management solutions you will not only do both, you will always have instantaneous access to your equipment, anytime from anywhere.



Horizontal solutions with direct network, serial, or modem access

New Zero U Solutions with up to 20 receptacles per unit at up to 30 amps

www.baytech.net
1-800 523-2702

BayTech®



Imagine an IT learning center
created just for you.



Web Developer



Network Administrator



MIS Manager

No matter what you do.

How can you quickly and easily find the best learning options for you and your staff – without spinning your wheels?

Simply go to NetSmart, Network World's new source for network and IT learning.

- Sign up for certification programs from respected training providers like Global Knowledge.
- Register for Network World's face-to-face seminars, Town Meetings, and Webcasts.
- And More!

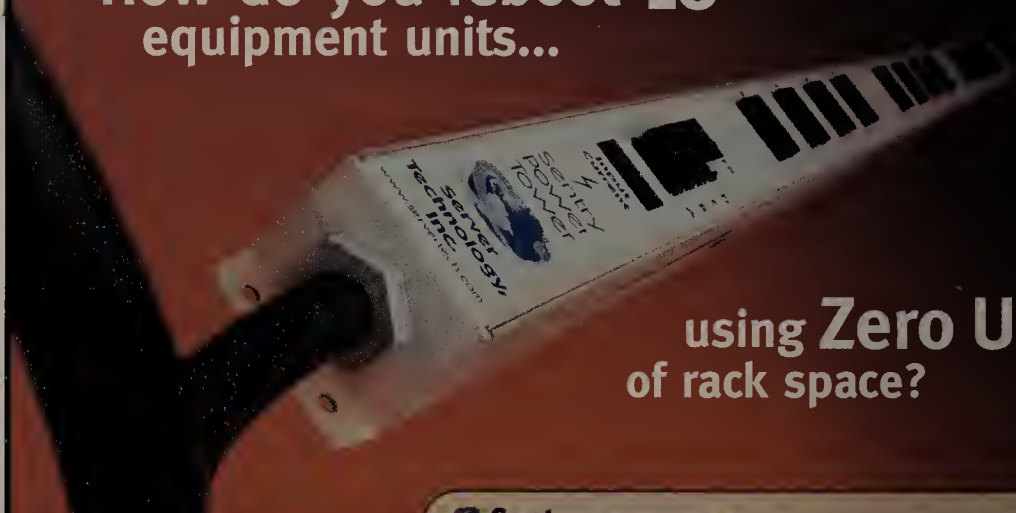


www.nwnetsmart.com

Sentry : PowerTower

How do you reboot 16
equipment units...

using **Zero U**
of rack space?



Sentry POWER TOWER : Your Zero U Reboot Solution



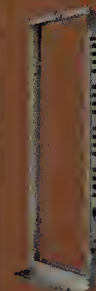
16 remotely addressable power outlets – The highest density available of any Remote Power Management vertical strip. 30-amp power input feed distributed across 16 outlets.

Mounts vertically in your equipment rack or cabinet and requires Zero U of rack space.

Load Sense provides real-time current monitoring in the remote screen interface and through a built-in LED display for on-site measurement.

Power-up sequencing of all 16 outlets prevents an in-rush current overload.

Telnet, SNMP, Modem or RS-232 Interfaces for easy, practical and secure power management of remote interconnecting equipment.



Install the new Sentry Power Tower in your data center, NOC or co-lo facility and gain the advantage of remotely rebooting up to 16 of your equipment units – without occupying any space in your rack or enclosed cabinet.

Try the New Sentry Power Tower in your rack or cabinet and realize the benefits of Intelligent Power Distribution and Remote Power Management.

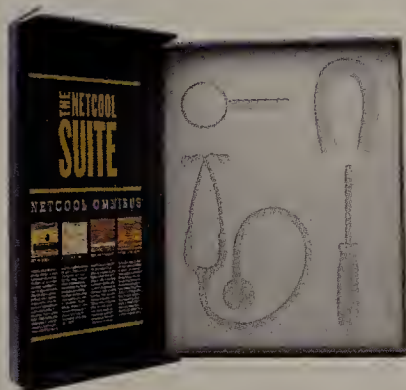
See our complete product line at www.servertech.com or call 800.835.1515 or 775.284.2000

Another great product from
Server Technology, Inc.



© 2001 Server Technology, Inc. Sentry is a trademark of Server Technology, Inc.

THE ONLY TOOL BOX YOUR NETWORK WILL EVER NEED.



Micromuse's Netcool® Suite™ of software tools is a carrier-class management solution that helps make sure your network is running smoothly and that your network services are always up.

It gives your network operations team a complete, scalable, out-of-the-box status monitoring solution... providing a digital dashboard view into everything that's happening throughout your network's infrastructure. In realtime.

Our fault-detecting Netcool software Probes & Monitors quickly find problems that may lead to trouble. They collect events from more than 300 management environments and devices... and consolidate them into one intuitive color-coded view.

That's why Micromuse is #1 in realtime fault management and service assurance.

The primary Netcool Suite applications tell you:



What is the problem ?
Netcool/OMNibus™ and
Netcool/Internet Service Monitors™



Who is impacted by the problem ?
Netcool/Impact™



Where is the problem ?
Netcool/Precision™



*Why did the problem occur...
and how do I fix it ?*
Netcool/Visionary™

The Netcool Suite is the core network operations tool set for the world's most successful Telecom-munications, Internet, Wireless and Broadband service providers as well as global Enterprises.

Micromuse's world-class service provider customer base includes AT&T, BT, Cable & Wireless, Cellular One, Charles Schwab, Deutsche Telekom, Digex, EarthLink, ITC^DeltaCom, MCI Worldcom, One2One, Verizon and XO Communications.

For more information go to: www.micromuse.com
or email: info@micromuse.com

MICROMUSE
NETCOOL® SOLUTIONS

Realtime. Uptime. All the Time



Tap into your NETWORK

GigaBit Fault Tolerant-Redundant Security Port Selector

Net Optics' Fiber GigaBit Fault Tolerant Port Selector detects fault line automatically to prevent your network traffic from stopping. This product is a MUST for ISP centers, and central offices with critical data. Works well with all GigaBit Servers, Switches brand names. **Network Redundancy!**

visit: www.netoptics.com/net-96260.html



Secure
your NETWORK

GigaBit Copper to SX, LX or ZX Fiber Converters

Net Optics' Gigabit Copper to Fiber Converter allows network managers to migrate to GigaBit Ethernet in a cost-effective manner. Simply plug-in the Cables.



visit: www.netoptics.com/sx-tx-converter.html

Unbeatable!

GigaBit ZX, LX to SX Media Converter

Net Optics' Fiber Optic Mode Converter is used to connect two devices operating with GigaBit multimode LX fiber to SX fiber. The fiber converter provides transparent conversion of optical signals.



visit: www.netoptics.com/converter-gig.html

Beyond The Box!

Fiberoptics Cable Assemblies

The Net Optics' total solutions approach can provide you with any type of fiberoptic cable assembly you need, from LC, MTRJ, SC, MIC, FC or Escon patch cords for your ATM, Gigabit and any other network.

Also available:

LC, SC, MT-RJ fiberoptic Loopbacks.

visit: www.netoptics.com/2.html



Loops!

Network Monitoring Accessories

In some countries ISP's must be TAPable... is the new Law!

GigaBit SX, LX or ZX, ATM, DS3, T1, Copper and Fiber Taps

These Splitter Taps have capabilities that will allow the networks to operate at a continuous flow while the tap is non-operational, thus maintaining network integrity. This enables you to monitor the network without disconnecting any one link!

The Fiber Splitter Tap has passive-link integrity that is maintained whether the device is on or off.

Copper Gigabit to Fiber Taps feature two Power Supplies which are load sharing. If either unit fails, the remaining power supply comes up to full power and takes over the additional load.

Compatible with all analyzer manufacturers including:

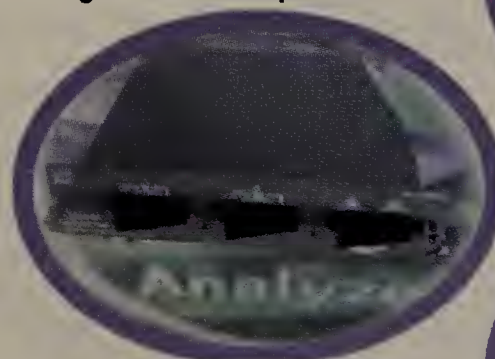
Network Associates' Sniffer®, Agilent's Internet Advisor and Cisco's SwitchProbe products.

visit: www.netoptics.com/11.html

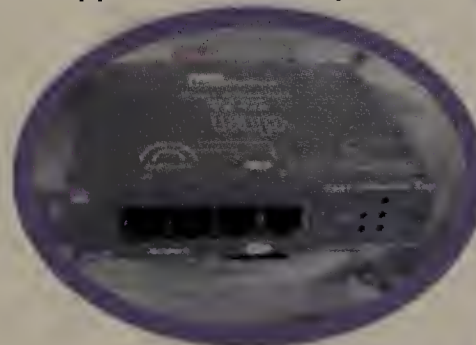
Net Optics' GigaBit TX to SX Tap is the market's first copper to fiber tap!

Intrusion Detection

GigaBit Fiber Tap



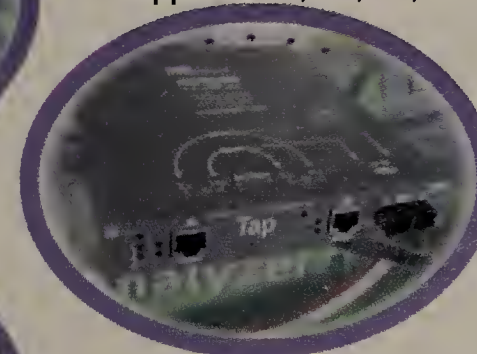
Copper 100BaseT Tap



Fiber LX to SX, ZX Tap



Copper to FX, SX, LX, ZX Tap



6 Station Tap



Troubleshoot NETWORK Problems

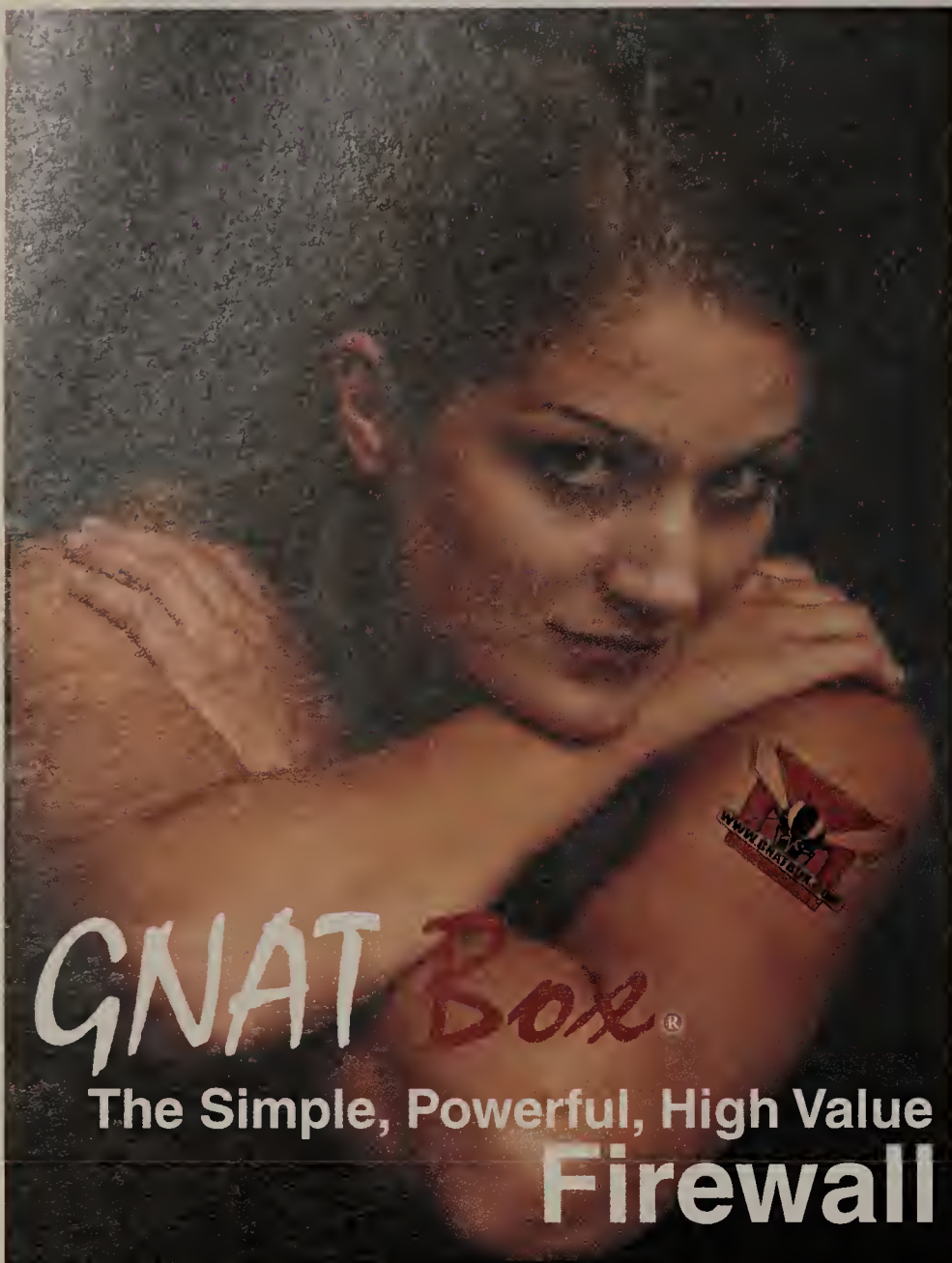
 NetOptics™

www.netoptics.com

Bright ideas... Built for speed!

Tap Diagnostic
Capabilities

Note: Sniffer® is a registered trademark of Network Associates Inc.



GNAT Box®
The Simple, Powerful, High Value
Firewall

At \$995.00 with an unlimited user license GNAT Box Firewall isn't cheap...it's cost effective.

Features Include:

- Proven Firewall Technology
- Dynamic Network Address Translation
- Unlimited User License
- High Performance
- Easy to Configure and Operate
- Remote Web Base Management
- Time Based Access Control
- Email, Pager & SNMP Trap Alerts
- Email Proxy with Anti-Spam Features
- Win95/NT Secure Remote Management
- URL and Content Filtering
- Supports Gigabit Ethernet, FDDI, TokenRing
- 10/100 Ethernet, DSL, Cable Modem & PPP
- IPSec VPN
- Built-in DHCP Server
- Built-in DNS Server
- ICSA Certified

Now Available in the GB Family of Firewall Appliances



Global Technology Associates, Inc.

Sales: 800-775-4GTA • Tel: 407-380-0220
gb-info@gta.com • www.gnatbox.com



Are You Gambling With Your Expensive Data Center Systems?

You may be if you aren't using SharkRack cabinets and racking systems. SharkRack systems are robust, attractive, and ergonomically designed. Our cabinets are made of the highest quality materials, including aluminum extrusion and heavy gauge steel. Cooling is always a requirement in a data center. That's why we use heavy duty fans in our cooling systems. SharkRacks also look great. In fact, our cabinets are featured in some of the world's foremost show-case data centers. Best of all, they're easy to set up and work with. Once your computer systems are placed in our cabinets, you can still access disks, CD-ROMs, and other components. SharkRack offers environmental monitoring appliances, KVM switches, and power distribution.

Give us a call today to see how we can help you
Save Space, Keep Cool, and Look Good.

**The Most Trusted Name In
Data Center Racking Solutions**

We rack servers and networking hardware from:

- Compaq™
- HP™
- IBM™
- Sun™
- Cisco™
- Almost any EIA standard 19" product

Dealer
Inquiries
Welcome

1-877-427-5722
www.sharkrack.com
infoshark@sharkrack.com

**SHARK
RACK**



**MULTI-PLATFORM
SERVER
CONTROL
IS EASY!**

■ **NEW** - Up to 8 ports in 1 rack unit rackmount case!

- Available with 2, 4, 8, 12, 16, 24 or 32 ports.
- Dedicated internal microprocessors that emulate the keyboard and mouse presence to each attached computer so all computers boot error-free 100% of the time.
- Crisp and clear 1900x1200 resolution.



800-742-8324

Email: sales@nti1.com

LOW COST KVM SOLUTIONS



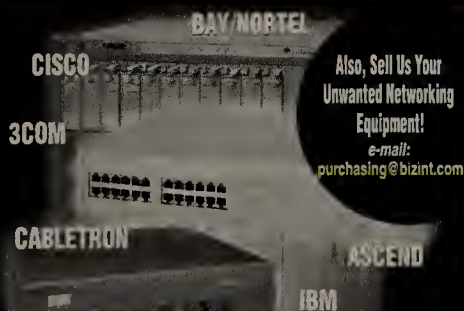
1275 Danner Drive • Aurora, OH 44202
330-562-7070 • FAX: 330-562-1999



Reserve your space today!

**Call Direct Response
Advertising
1-800-622-1108**

- 50-80% Savings off Retail List Prices
- 120-Day Warranty
- 100% 30 Day-Money Back Guarantee
- Large Inventory of Newer & Older Products
- In-House Knowledgeable Technical Support
- Supplying New & Quality Pre-Owned Networking Products for over 10 years
- Same Day Shipping



<http://www.bizint.com>

call us in the USA at:
(800) 406-3537 ext. 9375
 or (315) 458-9606
 fax: (315) 458-9493



**Your global partners in new &
quality used networking equipment**

info@bizint.com

W e B u y , S e l l & T r a d e

See us at the  **BICSI**
2001 Spring Conference
(BOOTH #89)



Call Toll Free (866) ALMETCO
(866) 256-3826



Please Visit our website at
www.almetco.com
sales@almetcoenclosures.com

Marketplace

USED CISCO DIRECT

www.digitalwarehouse.com

IMMEDIATE AVAILABILITY ON MOST PRODUCTS!

Save big on new/used: > Routers > Gigabit/FE/ATM Switches
> Access Servers > Optical Networking > Wireless **BUY/SELL/RENT**

> CISCO > Juniper > Lucent > Nortel > Marconi
> Foundry > Adtran
> Extreme > Quick Eagle

www.digitalwarehouse.com
DIGITAL WAREHOUSE
Your Information Superhighway Discount Source®

Netfast Communications Inc., 56-29 56th Drive, Maspeth, NY 11378 USA
Phone: 1-888-892-4726 or 718-894-7500 Fax: 718-894-1573
Network World - 5/2001

FIBER OPTIC SOLUTIONS

- T1/E1 & T3/E3 Modems
- RS-232/422/485 Modems and Multiplexers
- IBM 3270 Coax, AS/400 Twinax, and RS/6000 Modems and Multiplexers
- LAN - Arcnet/Ethernet/Token Ring
- Video/Audio/Hubs/Repeaters
- ISO - 9001

S.I. TECH
Toll Free 866-SITech-1
630-761-3640, fax 630-761-3644
www.sitech-bitdriver.com

TRAINING DIRECTORY

Cable University
(800) 537-8254
www.CableU.net
FREE online training in network cabling installation & maintenance

NetworkTraining.com
(800) NET-SKIL
(800) 638-7545
Network Analysis & Tool Training
Certified NetAnalyst Testing

New Jersey Inst. of Tech.
(800) 624-9850
cpe.njit.edu
Distance Learning: A+, Cisco, ASP, HTML, Dreamweaver, Java, Win2000

BNETSYS Inc.
(800) BNETSYS
www.bnetsys.com
Instructor led & online Cisco certification training @ no charge

Contact these companies today to help you with your training needs!

Since 1985

We Buy & Sell

CISCO

New & Used
Fully Guaranteed
Overnight Delivery

800.451.3407

90 Castilian Drive, Suite 110, Santa Barbara, CA 93117

Routers
Switches
Interface Modules
Access Servers
Accessories

www.networkhardware.com
BUY ONLINE

NETWORK HARDWARE RESALE

Products purchased as a result of Marketplace ads.

- ✓ Hubs
- ✓ Routers
- ✓ Software training
- ✓ Memory products
- ✓ Ethernet Cards
- ✓ Netware products
- ✓ Modems
- ✓ Testing equipment
- ✓ Multiplexers
- ✓ File Servers
- ✓ etc.
- ✓ etc.
- ✓ etc.

"Quick Ship" Premier Enclosures

Out the Door in 3-5 Days

Save Time Buy Online

Add plexi front doors, fixed or sliding shelves, keyboard shelves and more. Get the quick turn-around solution for all your datacomm and telecommunications housing requirements. *You'll be up and running fast.*

PREMIER Premier Metal Products Company

East Coast: 718-993-9200 ■ West Coast: 909-829-3089
www.premiermetal.com

- Standard 19 and 24 inch widths - multiple heights and depth
- Slotted top accepts cooling fan
- Louvered rear door
- Rugged, yet inexpensive

SUN MICROSYSTEMS • COBALT • CISCO SYSTEMS

SUN COBALT CISCO

renewed
USED
buy sell
LEASE

VISA MASTERCARD AMERICAN EXPRESS

Tel: 408.727.1122
Fax: 408.727.8002

3431 DE LA CRUZ BLVD. SANTA CLARA, CA 95054
WWW.RECURRENT.COM INFO@RECURRENT.COM

ReCURRENT technologies, Inc.

Solve Your Network Sync Problems with Wireless CDMA

NTP Time Server

- High Performance
- Low Cost
- Easiest Installation — No antenna hassle!

EndRun TECHNOLOGIES
www.endruntechnologies.com
1-877-749-3878

NORTEL NETWORKS

New-Used Buy-Sell

Wow! 89% Off!

Why Are We The Best?

- Nortel Service Contracts
- Next-Day Hardware Replacement
- Good As New Gear, Same as New Warranty — at Better Than New Prices
- Free Technical Support
- Competitive Prices

Refurbished Specials:	
BayStack 450-24T (AL2012E14) with MDA Port 10/100/1000 BT Autosense Switch Limited Lifetime Warranty	Special \$995 List \$2,695
BLN-2 Router Base Unit (71000) - Complete Includes Dual AC Power Supplies and SRML	Special \$1,999 List \$12,700
BCN Router Base Unit (73000) - Complete Includes Dual AC Power Supplies and SRML	Special \$2,999 List \$18,150
ARN 8 MB Ethernet Router Base Unit (CV1001003) Other Memory Config and modules available. Call now for pricing.	Special \$295 List \$1,134

Don't want used? Try our low prices on new! Call Today!

Call for Free Quote!
888-8LANWAN
(888-852-6926)

National LAN Exchange • www.nle.com

Celebrating Our 10th Anniversary

Sr. UNIX Administrator, Herndon, VA. Design, configure, install and administer UNIX system over the internet; develop and modify system according to user's functional requirements, evaluating hardware and software communications systems. Customize, debug and troubleshoot UNIX systems. Write Perl and shell scripts and work with DNS, SMTP and security. Requires M.S.C.S. and 2 years of experience. References required. M-F 40hrs/wk. Send resume and references to D. Williams, HR, Ref. #333, Picture Vision, Inc., 520 Herndon Parkway, Herndon, VA 20170.

Senior Programmer (Fairfield, CT) to design & implement data warehouse solutions. MS in Comp Sci/Math/Eng/related & 1 year experience required. Please send resume to: Cyber Dialogue, Attn: V. Garman, 304 Hudson Street, Floor 4, New York, NY 10013.

Software Developer
Responsible for researching design changes for new BSCS software billing line, ensuring BSCS database & functionality is designed in the best architectural fashion for performance, ease of maintenance, & adherence to rigid database design conventions; provide technical support to teams regarding data modeling & general functional issues; coordinate research issues for new software development specs & release schedules. B.S. or equivalent req'd in Computer Sc. or Engineering discipline. 2 yrs. exp. req'd in job offered or 2 yrs. related exp. as Software Research Eng. or Software Development Eng. \$66,789/yr. 40 hrs/wk. Report or send 2 resumes to North Metro, Job Order #GA6955424, 2943 N. Druid Hills Rd., Atlanta, GA 30329 or the nearest Dept. of Labor Field Service Office.

TECHNICAL SUPPORT ENGR. Resp. for sales proposals, engrg. & installation for programmable logic controller (PLC) applications & drive upgrades. Fielding & satisfying customer trouble calls for PLC & drive installations. Will also provide internal & external training in company products. This position requires extensive travel to client sites such as steel mills, power stations & public works facilities, w/ little time at the home office. Associate's degree in Engrg. or Electronics Technology plus 3 yrs. exp. in position offered or as Electrical Engr. or Customer Support Engr. req'd. Exp. must include writing application software for SIGMA AC & DC drive systems & upgrades of Westinghouse Varichron, AEG BL & SFC, as well as GEC analog & GDM sync drives. High mobility preferred. 40 hrs/wk, 8 a.m. - 5 p.m., \$55,000/yr. Qualified applicants report/submit resume to: Thomas Dembosky, Mngr., Indiana Job Center, 350 N. Fourth St., Indiana, PA 15701-2000. Refer to Job Order No. WEB169802.

CAD Programmer Analyst.
Analysis, design, development, testing, debugging, implementation and production support of a message switch system software running on Unix operative system in a multi-hosts communication environment using strong COBOL, C++, JAVA, UNIX scripting, Oracle database and various communications protocols; TCP/IP, SNA, Async, Bisynd; Customization and tailoring of baseline CAD programs to comply with project specifications. Develop, customize and maintain client specific software system using strong COBOL, C/C++, Java & Oracle database. Interact with clients to understand business rules and customer requirements and to develop functional specification of the application. \$60K/year. Bachelor's degree in computer Science or Engineering. Mail two copies of resume and copy of ad to: Agency for Workforce Innovation, P.O. Box 10969, Tallahassee, FL 32302. Job Order No. FL2157062. Job location: Tallahassee, Florida.

SOFTWARE ENGINEER
Analyze, dsgn., dvlp., code, test & implement commercial applications utilizing an in-depth knowledge of the system dvlpmt. life cycle. Dvlp. dsgns. based on specifications. Analyze, evaluate & modify existing or proposed systems. Coordinate w/ users to ensure efficient & timely delivery of systems. M.S. in Computer Science, Engrg., Business, Physics or Math req'd. (Bachelor's degree in one of the above-enumerated fields plus 5 yrs. of progressively responsive exp. as a Software Engr., Analyst Programmer, Systems Analyst or Software Consultant will be accepted in lieu of M.S.) Must have working knowledge of ERWin & BPWin dsgn. tools; MS SQL Server & Oracle RDBMS. High mobility preferred. 40 hrs/wk, 8 a.m. - 5 p.m., \$68,000/yr. Qualified applicants report/submit resume to: Thomas Dembosky, Mngr., Indiana Job Center, 350 N. Fourth St., Indiana, PA 15701-2000. Refer to Job Order No. WEB169442.

Technical Helpdesk Administrator:
Dev, est & imp internal guidelines for IT processes & Helpdesk functions for software apps. Perform technical monitoring administration. Diagnose & solve technical problems on software. Monitor and report on operational performance of software systems. Resumes to: Sr. VP Network Operations, Cargo Service Center, 255 Alhambra Circle, Ste. 630, Coral Gables, FL 33134.

Senior Systems Analyst. Plan, develop, test & document computer programs in COBOL, CICS, PL/SQL, C, CGI, DB2, IDMS, Java, Oracle 8.0 database, Informix & VSAM; evaluate user requests for new or modified programs to determine feasibility, cost & time required, compatibility with current system & computer capacities; perform operating procedures, formulate plans, outline steps required to develop programs on MVS, UNIX & Web platforms; prepare flow charts & diagrams; analyze, review & alter programs; oversee installation of hardware/software; provide technical assistance to program users. Must have a BS/Comp. Sci., Eng., related or equiv. & 2 yrs. exp. in the job offered. Send resume to NCCI, 901 Peninsula Corporate Circle, Boca Raton, FL 33487. Attn: HR-AC. No calls please.

Programmer/Analyst: (F/T), New London, CT. Perform in-depth systems analysis & dvlpmt of complex, technical or sensitive projects that impact integral data processing systems to support mgmt control & decision-making activities especially as related to BPCS on AS/400. Modify AS/SET prgms to adapt BPCS to corporate needs. Use RPG for in-house dvlpmt, maintenance. Req Bach in Comp or Info Sci, Engrg, or Math & at least 2 yrs exp in job or as Prgrmr/Analyst w/BPCS (Business Planning & Control System) prgms, AS/400 S/ware Engrg Technology (AS/SET), & RPG. Resume to D. Weisenberger, VP HR, Ortronics, Inc., 125 Eugene O'Neill Dr, New London, CT 06320.

SENIOR SOFTWARE ENGINEER to research, design, develop and formulate software systems for all-optical networking; analyze software requirements and develop graphical user interface with object-oriented techniques, Java and mathematical modeling. Require: Master in Computer or Electrical Engineering and three years experience in the job offered. Bachelor with five years experience may be substituted for Master and three years experience. Salary: \$75,000 per year, 9 am to 5:30 pm, M-F. Apply with resume to: Director of Human Resources, Movaz Networks, Inc., One Technology Parkway South, Norcross, GA 30092.

Computer/Information Designer
(Manh, NY): Develop Graphic User interface, Website, Info Design. Use exp w/site design & production tasks using Flash, Dreamweaver, Director. Bachelor's req'd in Communication Design or related field + 6 mos exp. Contact Spire: jobs@spire-id.com, fax 212-668-0108 Attn: Bil B.

Project Manager (Software Engineer)
International Telecommunications Software company has an opening for a Project Manager (Software Engineer) to coordinate and supervise development, implementation and integration of company's proprietary software with client networking and communications systems. Must have experience using C++, Java and NT. If interested, forward resume to: Maura Rodenhiser, HR Manager, Elron Telesoft, Inc., 7 New England Executive Park, 10th Floor, Burlington, MA 01803 or e-mail to petes@elrontelesoft.com

SOFTWARE ENGINEER
Analyze, design, develop, code, test and implement commercial applications utilizing an in-depth knowledge of the system development life cycle. Develop designs based on specifications. Analyze, evaluate and modify existing or proposed systems. Coordinate with users to ensure efficient and timely delivery of systems. M.S. in Computer Science, Engineering, Business, Physics or Math required. (Bachelor's degree or foreign equivalent in one of the above-enumerated fields plus five (5) years of progressively responsible experience in the position offered or as a Software Engineer, Analyst Programmer, Systems Analyst or Software Consultant will be accepted in lieu of M.S.) Must have working knowledge of Delphi front end; Oracle, MS SQL, SYBASE SQL Anywhere or MS Access RDBMS; and ADO, CORBA or ITS technology. High mobility preferred. 40 hrs/wk, 8 a.m. - 5 p.m., \$63,000/yr. Qualified applicants report/submit resume to: Anthony Gebicki, Mngr., Westmoreland County CareerLink, 300 E. Hillis St., Youngwood, PA 15697-1808. Refer to Job Order No. WEB 169434.

Engineers (Communications Technology - Associate Research) sought by E. Hartford, CT Co to dsgn & implmt data collection & analysis systems for remote diagnostics, control, & maintenance, incl s/ware reqmts analysis, systm architecture spec, selection of communication protocols, dvlpmt & debugging of prototype s/ware, & systm level testing. Dsgn & implmt of distributed optimization systems. Implmtn & dvlpmt of genetic algorithms for optimization of maintenance. Dsgn & implmt of neural n/work classifier systems & model surrogates. Regs Masters in Electrical or Comp Engrg & 9 mos exp in job or 9 mos as Research Assistant in niching genetic algorithms & neural n/work classifiers. Must have exp, pubs or courses in Telecommunications, Power Electric Systems & Softcomputing Systems. In lieu of Masters deg, candidates may qualify w/Bach & 2 academic yrs of add'l education beyond Bach deg in fields specified above. Exp may be pre-M.S. Resume to D. Juttner, HR Rep, Job NET2615-0106, United Technologies Research Ctr, 411 Silver Lane, MS-129-33, E. Hartford, CT 06108.

Software Engineer: Design, develop, implement and package Web-based software solutions using XML, Object-oriented development, C++, Java and Relational Database Management System. Requires: M.S. or equivalent in C.S., EE, Engineering or other quantitative field. Must have knowledge of HTML, XML, C++ and site authentication in web environment. 40hrs/wk (8-5); \$81,500.00/yr. Send two resumes/responses to Job Order #2001-204, P.O. Box 989, Concord, NH 03302-0989.

Sr. Internet Engineer wanted by investment Co responsible for applic dsgn & dvlpmt, technical architecture, project mgmt, web site dsgn & d/base admin in Oaks, PA. Requires BS or equiv in Comp Sci, Engrg or related field + 2 yrs exp in position offd. Respond to Daryl Cooper, Program Mgr, 1 Freedom Valley Dr, Oaks, PA 19456.

COMPUTER PROFESSIONALS MAKE IT YOUR BUSINESS TO GET IN ON E-BUSINESS

CHC is a strategic E-Business solutions and professional services company that is powering a new breed of rapid growth Internet developers. With thirty years of experience, CHC is a global leader in systems integration, migration and innovation, enabling companies to stay ahead of the technological curve.

Immediate opportunities for:

- WEB ARCHITECTS and
- WEB DEVELOPERS

w/ a combination of the following:

- COLD FUSION • SPECTRA
- ORACLE • VISUAL BASIC
- VISUAL C++ • SIEBEL • ASP
- COM, DCOM • JSP • HTML
- JAVA, JAVA BEAN • EJB JAVA SERVLETS • WEBSPPHERE
- IBM MQ SERIES • XML, UML
- MTS • CLARIFY • PERL
- OBJECTPERL • SPYPERL
- SMALLTALK • PL/SQL
- VISUAL AGE

We also have positions open for:

- PROJECT MANAGERS
- BUSINESS ANALYSTS
- SYSTEMS ANALYSTS
- WEB GRAPHIC DESIGNERS
- NETWORK ENGINEERS

with integration, registry, DLL's and MSI packaging

- OBJECT ORIENTED DESIGN
- CMM LEVEL II
- UNIX SYSTEM ADMINS

with Sun Solaris

For more detailed job descriptions, visit our website @ www.computerhorizons.com

We'll provide you with a stimulating supportive environment, attractive salaries and benefits including: Tuition Reimbursement, 401K Savings Plan Company Matched, Life, Health, Dental Plan, On-Going Technical Training and Employee Assistance Program. Please forward your resume to: Tom Culmore, Staffing Manager, Dept 514, COMPUTER HORIZONS CORP. 49 Old Bloomfield Avenue, Mountain Lakes, New Jersey 07046-1495. Call 973-299-4000 or 1-800-321-2421. Fax: 973-331-1632. E-mail: jobs@computerhorizons.com (in MS Word format only, please). An Equal Opportunity Employer M/F.

FIELD SERVICE TRAINING COORDINATOR

Dvlp., manage, coordinate & direct the Field Operations Training Department in order to operate, program, troubleshoot, & maintain existing & future customer base & core businesses. Dvlp. & coordinate the training courses for the training program to meet the customer training needs & obligations of the company. Provide in-house & onsite training for Process Industry & General Drives systems for various proprietary customer base systems. Quote & schedule training courses for both in-house & at customer sites to maximize customer satisfaction & meet the financial objectives. Dvlp. course outlines & content. Operate the training department to meet the financial goals & profit objectives laid out in the Field Operations Business Plan. B.S. in Electrical Engrg. or Electronics plus 3 yrs. exp. in job offered or as Electrical Engr. or Customer Support Engr. req'd. Must have knowl./exp. training technical personnel in customer support/installation of AC/DC variable speed drives & PLC programming. Must also have exp. in steel mill or similar industry using AC/DC drives, systems, PLC/PC controllers & machine interfaces. High mobility preferred. 40 hrs/wk, 8 a.m. - 5 p.m., \$55,000/yr. Qualified applicants report/submit resume to: Margaret Weckerly, Actg. Mngr., Butler County Job Center, 227 W. Cunningham St., Butler, PA 16003-0951. Refer to Job Order No. WEB171004.

Engineers (Sr/Associate Research) in Value Chain Dsgn sought by E. Hartford, CT Co to dvlp, facilitate & deploy new processes to generate, eval & select among organizational & product architectures for technology-based business ventures. Responsibilities incl evaluation & selection of process-improvement concepts, root-cause analysis, process literature searches; generation of quantitative modeling strategies, framing reqmts for quantitative models, rapid s/ware dsgn & prototyping of quantitative technical models & Win-based & web-based user interfaces, process & s/ware documentation; rapid learning of new process methods & tools; teaching & training; intense technical facilitation, meeting planning & coordination, business-sector searches, multi-audience technical presentation, rapid electronic note-taking, process interpretation. Candidates must have Bach in Mechanical or Electrical Engrg; Masters in Industrial Engrg, System Dsgn or System Engrg, Operations Research &/or Comp Sci; & at least 2 yrs exp in job or in IT, incl Enterprise Application Integration, eCommerce applic dsgn & large-scale d/base-driven applic implmtn performing multi-layered s/ware framework dsgn & implmtn w/prgmg in Java, XML/HTML, C & either MATLAB or Mathematica. Education &/or exp must incl Axiomatic Dsgn (functional modeling), System Dynamics & Engrg, Combinatorial & System Optimization (Linear & Non-Linear Prgmg). Exp may be pre-Masters. Resume to D. Juttner, HR Rep, Job NET2610-0105, United Technologies Research Ctr, 411 Silver Lane, MS-129-33, E. Hartford, CT 06108.

Position available for **Applications Engineer** with the following qualifications:

Job Duties for this position include: Providing telephone support to customer's worldwide with the installation and programming of Dialogic's PC-Based hardware and software products; use of the C and C++ languages for API (Application Programming Interfaces); Trouble shooting hardware and software concerns of the customers; Configuring and Networking the computer telephone integration systems.

Minimum requirements for this position include: A Masters Degree in Computer Programming and one (1) year as a programming engineer or applications engineer.

Wages for this job are \$53,100.00 per annum. The normal working hours are 9:00 a.m. - 5:00 p.m. (40 hour work week). Location of the job is Greenville, South Carolina. If interested in this position, or if you know of qualified persons who might be interested, send two (2) Resumes to:

Ms. Regina Ratteree
E & T Technical Services
SCESC - SC2001289
POST OFFICE BOX 1406
COLUMBIA, SC 29202

System Administrator (Atlanta, GA): Identify, troubleshoot, correct malfunctioning software/hardware systems. Maintain & support Microsoft applications, Server software & tools, IES, IIS, PDC, BDC, proxy Servers, Firewalls, DNS, routers, Switches & system programming. Req. B.S. in C.S. plus 1 yr. Exp. Resume to HR Manager, Media1st.com, 1430 West Peachtree St., 700 Earthlink Bldg., Atlanta, GA 30309.

It's Fast.
It's Huge.
It Crosses
Worlds
&
Dimensions.
IT CAREERS

**PROGRAMMER/ANALYST
DATABASE ANALYST**

Offshore Digital Services seeking candidates with commercial experience in the areas listed below -

- programmer/analysts and application programmers with 2-7 years commercial experience. Candidate should have a BS (or foreign equivalent) in Computer Science or a related field

- database analysts and developers with minimum 3 years commercial experience. Candidate should have an MS (or foreign equivalent) in Computer Science or a related field

Full time permanent positions are available in the San Francisco Bay area, and nationwide.

Operating System - Unix, MS Windows, NT/95, OS/2

RDBMS - Sybase, Oracle, MS SQL*Server, Informix

Front-end tools - Visual Basic, PowerBuilder, Developer 2000, Designer 2000

Applications - ERP, Inventory, Purchasing, Distribution

Internet Programming Tools - Web Servers, ASP, Java

Languages - C, C++, Perl

Offshore Digital Services provides competitive salaries, benefits, and a bonus program designed to encourage long-term employment and increased customer revenue. Interested? Send a detailed resume with post applied for, education background, project experience, and geographic preferences to:

The Personnel Manager Offshore Digital Services, Inc.

14798 Wicks Boulevard San Leandro, CA 94577

Fax: 510-483-1819 Email: personnel@odsi.com



Senior Software Engineer required to lead team of s/w engineers to design, develop and support web application for shipping & transportation industry. MS in Computer Sc. or related fields with 5+ yrs exp. in Oracle DB Design, DBA, PL/SOL & JAVA. Send CV to: Elogicity, Inc., Attn: H.R. Dept., 4457 Willow Rd., Ste# 100, Pleasanton, CA 94588 or fax (925)251-0388.

BrightStar (formerly SCS America) is searching for Siebel and SAP Analysts/Consultants for Basis, Sales, Distribution, HR, or Payroll projects. Send resumes to: BrightStar, 4900 Hopyard Rd., Suite 200, Pleasanton, CA 94588, Attn: HR; or e-mail to resumes@brightstar.com.

ENGINEERING
Avnisoft Corporation is a high growth, privately held company providing software development and services for UNIX / NT systems software, telecommunications, internet working, internet and embedded application industries. We are currently recruiting for our California site:
• Software Engineers
• Senior Software Engineers
We offer excellent benefits and a competitive compensation package. Send resumes, to: Avnisoft Corporation, ATTN: HR, 550 Lakeside Drive, Suite 5 Sunnyvale, CA 94086. Email: jobs@avnisoft.com; Fax: (408)-358-0105; Web-Site: www.avnisoft.com

SYSTEMS PROGRAMMER (St.

Louis, MO) -Needed for Info. Tech. Co.; BA Comp. Sci., Math or equivalent & 2 yrs. exp.; Fax CV to S. Dent, HR @ (314) 984-0889

Programmer Analyst (2 positions) - Plans, develops, tests and documents computer programs, applying knowledge of programming techniques and computer systems. Will perform routine tasks and will work under close supervision while assisting staff. Work is closely monitored and reviewed for accuracy. Requires Bachelor in Computer Science, Engineering or Mathematics. 5 day, 40 hr/wk, \$44,000/yr. Please mail resumes to Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order number JL1118352.

SENIOR SYSTEMS ANALYSTS.
Req's Master's deg in Comp Sci or Bach's deg in Comp Sci plus 5 yrs prog resp exp as Systems Analyst or related occup. Resp for designing, developing & implementing software systems as well as Windows and Web dev't. Req'd skills include MS InterDev 6, ASP & Visual Basic. Microsoft Cert'd Prof'l a plus. E-mail resume to knowlton@teampc.com or send resume to Julie Knowlton, Technology Professionals Corp, 1 Ionia SW, Ste 400, Grand Rapids, MI 49503.

Software Engineer: Designs and develops mechanical load cells for determining weight accuracy of packages and other postage related items and insures integration of such mechanical load cells with various electronic hardware design. Develops appropriate hardware codes for proper scale functioning including design and development of control systems for load cell testing and quality control assurance. Modifies electrical and electronic scales for use in various international settings. Designs, develops, implements, and modifies a remote access software system which is capable of accessing and receiving postal rate change information functions for use in various postal scales to insure processing payment of postage rates. Requires Master's degree in Electrical Engineering, Software Engineering, or Computer Integrated Manufacturing System. Also requires two years experience in the job to be performed. Hours: 8:00 a.m.-5:00p.m. 40 hours per week at \$65,000.00 per year salary. Job Location: Wheeling, Illinois. Applicants must show proof of legal authority to work in the U.S. Please send two copies of resume and cover letter to Illinois Department of Employment Security, 401 S. State Street-7 North, Chicago, IL 60605, Attention: Joanne Breaux, Reference #V-IL 25659-N, AN EMPLOYER PAID AD. NO CALLS.

GAVS Information Services Pvt., Ltd., a Denver-based consulting company, seeks qualified individuals to fill the following positions: Project Manager, Programmer Analyst, Senior Programmer Analyst, Software Engineer, and Senior Software Engineer. The positions are located in Denver, Colorado. Interested individuals should send their resumes to: GAVS Information Services Pvt., Ltd., 4155 E. Jewell Ave., Ste. 603, Denver, CO 80222.

Corliant, Inc. provides IT strategy consulting, systems integration and software development to clients nationwide. We have immediate, full-time opportunities for both entry-level and experienced professional in any of the following areas:

SAP R/3

- ◆ Functional (Financials, Logistics, HR)
- ◆ Technical (BASIS, ABAP, ALE/EDI)

NETWORKING

- ◆ Network Engineers & Consultants
- ◆ Systems Engineers (MCSE)
- ◆ LAN/WAN Specialist (CISCO)

APPLICATION DEVELOPMENT

- ◆ Microsoft Certified Solution Developer (Visual Basic, Visual C++)
- ◆ Database Administrators (Oracle, SQL Server)
- ◆ Web Based Development (Java or JavaScript, CORBA, Microsoft ASP, ActiveX, COM/DCOM)

Job opportunities are also available for Sale Managers, Marketing Managers, Business Managers, Human Resources Managers, Controllers and Technical Recruiters. Bachelor's or Master's degree required, depending on position. We also accept the foreign education equivalent of the degree or the degree equivalent in education and experience. Excellent benefits. Send confidential resume and salary requirements to: Corliant, Inc, 8 Neshaminy Interplex, Suite 209, Trevose, PA 19053. An equal opportunity employer.

Senior Software Engineer: Job Location: Plano, Texas. Duties: Design, develop, troubleshoot and debug embedded software for real-time operating systems, compilers, routers, networks, utilities and databases using C/C++, Microsoft Visual C++, assembly for PowerPC and MIPS, shell scripting, and Tornado software development. Create, design software system analysis document for various projects. Design, analyze, implement, test and modify local, network or internet-related computer programs for commercial or end-user applications-hardware verification tools, desktop applications, firmware. Develop, apply and maintain quality standards and related protocols for software products. Design and create test plans and procedures and interfaces with software/hardware engineers regarding the results of the test. Requires: Master of Science in Computer Science or related field, and 2 yrs. exp. in the job offered or 2 yrs. exp. as a Software Engineer. Experience, which may have been obtained concurrently must include: 2 yrs. exp. working with C/C++, Visual C++, and vxWorks BSP. Send resumes (no calls) to Matthew D. Brandalise, Integrated Device Technology, Inc., 2975 Stender Way, Santa Clara, California 95054.

Vice President, Content Group. Job Location: Houston, Texas. Duties: Direct and coordinate activities of the Content Group in order to meet the profitability and growth objectives for the Content Factory operations. Formulate and administer company policies and develop long range goals and objectives. Direct and coordinate department activities to meet goals and objectives. Review achievements and propose changes in goals or objectives. Supervise Manager of Content, Development Analysts, Operation Analysts, and Administrative Assistant. Manage clients' needs and potential for products, tools, and interfaces. Assess partners for hosting solutions in emerging new markets. Develop partnership relations with third party companies to achieve scalability and market diversity. Requires: Bachelor's or Foreign Equivalent in Management Information Systems or related field and 2 yr. exp. in job offered or related occupation which may have been obtained concurrently. EOE. Send resume (no calls) to Fernando Claudio, Vice-President of Human Resources, Procure Net, Inc., 2 Madison Rd., Fairfield, NJ 07004.

Senior Consultant needed for computer software development and consulting firm. Job duties include: analyzing, designing, developing, and implementing computer software applications. Database administration in relational database systems using: Oracle, Developer/2000, SQL*DBA, SQL*Loader, SQL*Forms, PL/SQL, UNIX and Windows NT. Applicant must have MS in Computer Science, Mathematics, Engineering or Business. Applicant must have 2 years experience in the job duties listed above or 2 years experience in any computer related occupation. Experience must include 2 years of database administration in relational database systems using Oracle, PL/SQL, SQL*DBA, SQL*Loader, SQL*Forms and UNIX. Mon-Fri, 40 hours per week, 8:00am-5:00pm, \$62,442.00/yr. Applicants must show proof of legal authority to work in the US. Send resumes to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, IL 60605, Attention: Sheila Lindsey, Reference #V-IL 24700-L, An Employer Paid Ad, NO CALLS-SEND 2 COPIES OF BOTH RESUME AND COVER LETTER

Software Engineer sought by software consulting company in Englewood, CO. Design, develop, implement, and maintain ORACLE software applications and relational database management systems. Engage in full life-cycle software development and/or administration of ORACLE-based enterprise resource planning (ERP) software applications. The applications run in a client/server environment or are web-based. Analyze requirements. Create designs and design documentation. Code, test, and debug the software applications. Use shell scripting, programming language C, Pro*C, the full ORACLE tool set, HTML, and JAVA in the design and development process. Engage in project management as required. Requires Bachelor's or foreign equivalent in Comp. Science or related field; 2 yrs designing and developing ORACLE software applications; Working knowledge of ERP applications, shell scripting, Pro*C, and the ORACLE tool set. \$90,000/yr; M-F; 8am-5pm. Respond by resume to James Shimada, CO Dept. of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202 and refer to Job Order No. JL 1118515.

Network Analyst/Programmer sought in Rockford, IL. Responsible for LAN, WAN, HP3000, MPE & NT operating systems, Net Servers, T1 and communications devices. Ability to program for web development. Must be proficient in Cobol and Visual Basic. B.S. Degree in Computer Science and min 2 yrs exp. 40 Hrs/Wk. \$36,000/Yr. M-F 9a.m.-5p.m. Some travel. Applicants must show proof of legal authority to work in the U.S. Respond to Illinois Department of Employment Security, 401 S State St - 7 North, Chicago, IL 60605 Attn: Brenda Kelly. Ref #V-IL24212-K. An Employer Paid Ad. NO CALLS. SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

Sr. Software Engineer, 2 pos. Denver, CO. Dsgn, dvlpmt, testing, integration, maintenance & customization of bus s/ware applic prgms; Implmt client's functional reqmts in dvlog tech applic architecture & tuning of C/S applics.; Dsgn functional specs for applic prgms.; Documentation of prgms, creation of test data, test scripts & execution of test scripts applying knowl of SAP, Lotus Notes, MO-Series, Java, & DB/2 on multiple h/ware & s/ware platforms. MS Comp Sci (or foreign deg equiv) + 3 yrs exp or BS + 5 yrs exp. 40 hr/wk. \$66,100/yr. Application by resume to CO Dept of Labor & Employment, Attn: Jim Shimada, Tower 2, Ste 400, 1515 Arapahoe St., Denver, CO 80202-2117, ref to JO# JL1118507

Software Engineer sought by software consulting company in Denver, CO to work in Los Angeles, CA & other unanticipated job sites in the US. Engage in full life-cycle software development in a client/server environment. The software applications run on UNIX & Windows operating systems, & incorporate ORACLE relational database management systems. Analyze requirements & create designs. Code, test, debug, & modify the software applications. Use Visual Basic, SOL/Server, SQL/Navigator debugging tool, & Developer 2000 in developing the software applications. Train users of the software applications as necessary. Requires Bachelor's or foreign equivalent in Comp. Science or Eng. (including Elect. & Comm. Eng); 2 yrs exp. in full life-cycle software development in a client/server environment. \$66,100/yr; M-F; 8am-5pm. (5 openings) Respond by resume to James Shimada, CO Dept. of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202 & refer to Job Order No. JL 1118514.

Software Engineer (2 positions) - Research, design and develop computer software systems in conjunction with hardware product development applying principles and techniques of computer science, engineering and mathematical analysis. Requires 4 years experience in the job offered or 4 years experience as Programmer Analyst, Systems Engineer, Systems Analyst. Must have 1 year experience using PowerBuilder and Sybase. 5 day, 40 hr/wk, \$67,500/yr. Please mail resumes to Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order number JL1118520.

Network Architect: Implement, perform, plan multi-protocol networks, consultation/proj.mgmt on Datacom LAN/WAN 10/100/1000 Ethernet TCP/IP SNA SNMP Unix. Req: MSEE or BS w/ 5 yrs exp. 40hr/wk, Job/Interview: San Jose. Send resume Sprint eSolutions, Box 264443, SJ, CA 95159

IT Professionals

Entergy, one of America's largest utility companies, has multiple openings for the following occupations in multiple locations:

- Information Technology Professionals
- Systems Analysts
- Computer Programmers
- Software Engineers

For immediate consideration, please forward your resume and salary requirements to: Entergy Corporation and operating subsidiaries, Attn: Ms. Lori Hendler, HR Department, PO Box 61000 New Orleans, LA 70161. Phone: 504-576-4117 EOE/M/F/D/V Principals only. You will only be contacted if you are considered for an interview.

Software Engineer (2 positions) - Research, design and develop computer software systems in conjunction with hardware product development applying principles and techniques of computer science, engineering and mathematical analysis. Requires Master or equivalent in Computer Science, Engineering or Mathematics. Equivalent is Bachelors plus 5 yrs exp. Requires 3 yrs exp if Masters or 5 yrs exp if Bachelors in the job offered or as Systems Engineer, Programmer Analyst or Systems Analyst. Must have 1 yr exp using Oracle. 5 day, 40 hr/wk, \$85,000/yr. Please mail resumes to Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order number JL1118353.

**e-lite
companies**

**e-merging
companies**

**e-essential
companies**

**e-normous
opportunities**

IT careers.com

where the best
get better
1-800-762-2977

Call your ITcareers Sales Representative 1-800-762-2977



WHO? WHERE? HOW MUCH? THE COMPUTERWORLD SALARY SURVEY

COMPUTERWORLD'S 15TH ANNUAL SALARY SURVEY

This in-depth look at the IT salary picture is widely anticipated and ardently discussed by the thousands of Computerworld readers - and their colleagues, bosses, and employees. This survey provides facts to help developers and analysts know where they stand and should be in the battle for higher pay.

Each week, more than 935,000 executives and professionals read Computerworld for the latest news and analysis of the technology that powers today's leading enterprises.

The Annual Salary Survey for IT Professionals is an ideal vehicle for delivering your recruitment advertising to this high-value pool of business-oriented IT professionals.

Issue date: September 3

Space Due: August 22

Materials Due: August 30

For more information, call
Janis Crowley at 1-800-762-2977, or
email janis_crowley@itcareers.net

COMPUTERWORLD



Work all day on one
of the nation's
largest networks.
Then go home
or wherever.

Sure, we have one of the country's largest privately owned computer networks and the #15 ranking on the Fortune 500 list. And of course, our salaries are highly competitive. But what makes working here so special are our family-friendly benefits packages, easy-going lifestyle, diverse workplace and welcoming communities. No wonder we were included in *Computerworld's* "100 Best Places to Work."

Contact State Farm Human Resources at jobopps.corpsouth@statefarm.com for information about current positions. Or visit our website at statefarm.com.™



Get there with State Farm.

State Farm Insurance Companies • Home Offices: Bloomington, Illinois
An Equal Opportunity Employer

Purdue University
Faculty Position
Computer Information
Systems & Technology

Purdue University's Department of Computer Technology invites applications for four or more tenure-track, assistant professor positions at its West Lafayette home campus and various statewide outreach campuses, beginning in August 2001. The department's mission focuses primarily on teaching, educational scholarship (not basic or applied research), and industry/professional outreach. The West Lafayette positions exist in the areas of (1) telecommunications and networking, focusing on network administration and management, (2) software development using Java, Visual Basic and web scripting languages for object-oriented, component-based Internet and client/server information systems, (3) advanced multi-tiered object-oriented system design involving a variety of current Internet and client/server skills, UML and project management, and (4) database design, programming, and advanced applications (e.g., data warehousing). West Lafayette candidates must participate in both undergraduate and graduate education assignments. Candidates for statewide outreach positions should be able to teach a variety of foundation courses in end-user computing, application programming, database, systems analysis and design, and data communications. All candidates must have an earned Masters Degree in a relevant field (the doctorate is not a requirement for employment, promotion, or tenure for these positions). All candidates should have at least three years of full-time, relevant, industrial experience in information systems and business computing. Prior teaching experience is also preferred. Applications will be accepted until the position is filled. Send a detailed resume and academic transcripts to CPT Search and Screen Committee, Ad Code NW, Department of Computer Technology, Purdue University, 1421 Knoy Hall 242, West Lafayette, IN 47907-1421. Questions should be directed to Professor Jeffrey L. Whitten (West Lafayette) at phone (765) 494-4545, or on the Internet at jlwhitten@tech.purdue.edu. Purdue University is an equal opportunity, affirmative action employer.

COMPUTER

NOVASOFT INFORMATION
TECHNOLOGY CORPORATION
& NOVASOFT INCORPORATED

Software consulting firm and web development company is seeking qualified professionals (bachelors degree +) for the following nationwide positions:

Members of Technical Staff:
(Analysts Programmers, Systems Analysts, etc.)

- Web Developers (Java, ASP, Coldfusion)
- Web Masters
- ERP/CRM Professionals (Siebel, SAP, BAAN)
- Client Server (Oracle, C, C++, VC++, VB)

Administrators:

- Systems Administrators (UNIX, Sun Solaris, HP-UX, AIX, Windows NT, Cisco)
- DBA's (Oracle, Sybase, SQL Server)

Corporate Staff:

- Technical Recruiters/Data Process Professionals
- Sales/Account Executives
- HR Professionals

Excellent salary and benefits package available. Fax or e-mail resumes to:

HR Department
NovaSoft Info Tech. Corp.
or eNovaSoft Inc.
Fax: 609-588-5577
E-mail: NovaSoft:resumes@novasoftinfo.com
eNovaSoft: info@novasoft.com

HIGH TECH CAREER OPPORTUNITIES

Enhance your career possibilities with exceptional room for professional growth. We are seeking individuals for a variety of positions throughout the United States.

Siemens Information and
Communication Networks, Inc.
Siemens Information and
Communication Mobile, Inc.
Siemens Carrier Networks, LLC
Siemens Enterprise Networks, LLC
Optisphere Networks, Inc.

- Software Engineers/Technicians
- Communication Engineers/Technicians
- Test Engineers/Technicians
- Customer Service Engineers/Technicians
- Field Engineers/Technicians
- Telecommunications Engineers
- Optical Engineers/Technicians
- Programmers/Programmer Analysts
- Systems Engineers/Systems Analysts
- Wireless Engineers/Technicians
- Network Engineers/Technicians
- Design Engineers
- Technical Support Specialists
- Hardware Engineers/Technicians
- Project/Product Managers
- Database Administrators/Design Analysts
- User Support Specialists/Supervisors

And a range of other IT and IT support positions

Qualified individuals will have appropriate Bachelor's, Master's and/or equivalent technical experience for position level. Siemens provides extensive benefits, competitive salaries and relocation packages.

Email (preferred) your resume to:
siemens@resume.isearch.com

Or mail your resume to:
Siemens, PO Box 92171, Los Angeles, CA 90009-9998.
Siemens is an Equal Opportunity Employer EOE M/F/D/V

Trusted by
more
hiring
managers
than any
IT space
in the
world.

IT Careers in E-Business

When strong businesses look to the Internet as a new channel for sales and distribution, the results tend to add strength. For some e-retailers, the foundation for the business was set early in the evolution of online sales. The result for these companies tends to be an operation that is succeeding as a business and that is breaking down walls in terms of creating new technologies and systems.

Enzo Micali, chief technology officer, says **1-800-Flowers.com** is a multi-channel retailer that went public in 1999. Analysts are estimating that revenues will run between \$440 and \$450 million in the fiscal year ending in June. Yet this is no upstart. **1-800-Flowers.com** was a pioneer in e-retailing, launching its first sales proposition in 1992 via CompuServe. "We were the first merchant on America On Line in 1994 and established our own website in 1995," Micali says.

As a pioneer in technology, **1-800-Flowers.com** continues the push, now moving into the wireless environment. The company also recently brought in-house its web development operations and continues to enhance the

capabilities for business operations and users. "We have as long and as rich an e-commerce history as anyone in the business, so this is a natural evolution for us," explains Micali.

1-800-Flowers.com continuously searches for IT talent. "We look for big company experience," Micali says. "We are no longer a small company, and as we move/grow toward \$1 billion in revenues, we are looking for people who have performed in this type of environment. We also need people who have managed or established processes and structure. The third thing we look for on resumes is potential – not just what someone has done so far, but how much farther they can grow."



The employment proposition at **1-800-Flowers.com** continues to develop. "We are an e-commerce pioneer, which means with this company you will be part of a history of developing, testing and implementing technology," Micali says. "Because we're growing, there's potential for you – in terms of what you will learn and where your career can go. Finally, we're proven – we've been around and have a business model that will hold for the long run."

ITcareers

Far more job opportunities with e-business firms, turn to the pages of ITcareers.

- If you'd like to take part in an upcoming ITcareers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.
- Produced by Carole R. Hedden
- Designed by Aldebaran Graphic Solutions

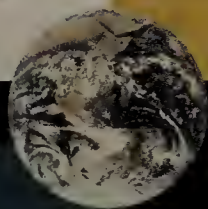
Founding Sponsor

Microsoft®

&

Intermediagroup
an Intermedia.com company

Present:



CONFERENCE & EXPO

wireless
ONE™

The business and technology
of the mobile economy

A CAN'T MISS VISIONARY KEYNOTE!

Conference:

May 29 - June 1, 2001

Expo:

May 30 - 31, 2001

Hilton New York
New York City



State of the State of Wireless
William Kennard
Former Chairman
Federal Communications
Commission (FCC)

www.imgevents.com/wireless IDG5/14

2001 USENIX Annual Technical CONFERENCE

June 25-30, 2001

TECH SESSIONS: Thursday-Saturday

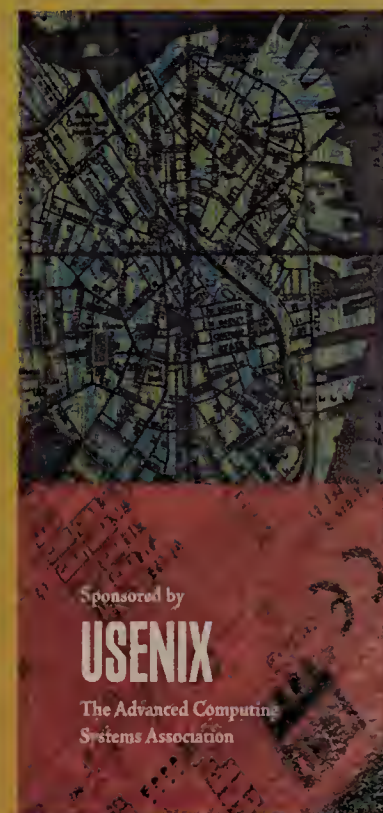
EXHIBITION DATES: June 28-29, 2001

Boston, Massachusetts

THIRTY TUTORIALS in all,
seventeen brand-new.
Here's just a sampling:

- ♦ Blueprints for High Availability
- ♦ Examine the Linux Kernel
- ♦ Master Advanced Solaris Administration
- ♦ Explore the Potential of LDAP

Keynote Speech by Daniel D. Frye,
Director of IBM Linux Technology Center



<http://www.usenix.org/events/usenix01>

Produced by:
Intermedia Group
 on **STAFFING** Solutions
META Group



www.imgevents.com/itstaffny

Strategic IT Staffing CONFERENCE

May 30-31, 2001
Hilton New York

Best Practice Strategies for Managing the Staffing, Recruitment and Retention of IT Professionals

Co-Sponsors:
 ACCIS Chimes eJobs
 FIELDGLASS HireAbility.com recruitsoft
Media Sponsors:
 atnewyork.com ebiz IDG
 careers.com INTERNET CAREER RESOURCES.COM
 jobs.internet.com JustTechJobs.com
 PURPLE SQUIRREL SOFTWARE

FROST & SULLIVAN

Hilton Fountainebleau Resort
Miami Beach, Florida

2nd Annual eBusiness Strategies Conference and Exhibition, East

Maximizing Revenue and Growth Opportunities Through Technology Integration

KEYNOTE PRESENTATION BY

DR. RAVI KALAKOTA
 Founder & CEO
 eBusiness Strategies


CONFERENCE SPONSORS



Executive Summit
 May 20-21, 2001

General Session
 May 22-23, 2001

For more information contact
ebrown@frost.com
 Tel 212.652.2705
 Fax 917.229.3504
www.conferences.frost.com



JavaOneSM

Sun's 2001 Worldwide Java Developer Conference

ACCEPT NO LIMITS

Code outside the lines:
 Get the blueprints for smart Web services at the JavaOneSM conference.

Discover the unlimited potential of JavaTM technology to fuel your creativity. Learn from the world's top experts in Java technology on how to build smart Web services that connect the largest servers to the ubiquitous desktop to the tiniest devices. At the JavaOne conference, network with top developers, see real-world solutions and learn the latest from Sun on the world's leading development platform.

The JavaOneSM Conference
 MAY 4-6, 2001

The JavaOneSM Pavilion
 MAY 6-7, 2001

Free your mind and your code will follow.

REGISTER TODAY.
 When registering, use priority code CWMG.

<http://java.sun.com/javaone/>
 Or call 888-886-8769; International 781-433-1509.

Sponsored by
 Copyright ©2001 Key3Media Events Inc. All rights reserved. Sun, Sun Microsystems, the Sun Logo, Java, JavaOne, the JavaOne logo, the Coffee Cup logo, the Duke logo, J2SE, and all Java, J2SE, and Forte-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems Inc. in the U.S. and other countries. Key3Media and Key3Media Events are trademarks or registered trademarks of Key3Media Events Inc. in the U.S. and other countries. Produced by Key3Media, Inc. Sponsored by Sun Microsystems, Inc.

Produced by
 Key3Media Group

POWER YOUR FUTURESM



Win Some Real Power at rhic.com/win.

600 horses worth, to be exact.

Log in at rhic.com/win right now,* and enter for a chance to win a high-speed adventure for two behind the wheel. We're also giving away a Sony[®] PlayStation[®]2 every week, complete with the NASCAR[®] 2001 road race game.

So register today — the contest only runs April 2nd to May 27th. And let rhic.com put the power in *your* hands.

At the Las Vegas Motor Speedway.

RHICONSULTING[®]
 Technology Professionals
rhic.com/win • 800.255.1292

*Open to legal Continental US and Canadian (except Quebec) residents 21 years of age or older. For details and rules, visit rhic.com or send a self-addressed envelope to RHI Consulting Sweepstakes, 2884 Sand Hill Rd., Suite 200, Menlo Park, CA 94025. NO PURCHASE NECESSARY. Void where prohibited or restricted. All trademarks, registered trademarks and service marks belong to their respective owners. © RHI Consulting EOE

Network World, Inc.

118 Turnpike Road, Southborough, MA 01772
Phone: (508) 460-3333

TO SEND E-MAIL TO NWW STAFF
firstname_lastname@nww.com

Evilee Thibeault, CED/Publisher
John Gallant, President/Editorial Director
Eleni Brisbois, Administrative Planning Manager

FINANCE

Mary Fanning, Vice President Finance
Paul Mercer, Finance Manager
Mary Kaye Newton, Billing/AP Coordinator

HUMAN RESOURCES/BUSINESS SERVICES

Monica Brunaccini, V. P. Human Resources/Business Services
Elizabeth Price, Human Resources Manager
Eric Cormier, Human Resources Associate Rep.
Frank Coelho, Business Services Manager
Lisa Thompson, Business Services Administrator
Mark Anderson, Business Services Supervisor
Kevin McMillen, Business Services Coordinator

MARKETING

TerryAnn Croci, Director of Marketing
Wendie Larkin, Public Relations Manager
Barbara Sullivan, Senior Research Analyst
Johanna Lombardi, Marketing Communications Manager
Donna Kirkey, Senior Design Manager
Kristin Wattu, Senior Marketing Specialist
Judy Schultz, Senior Graphic Designer
Cindy Panzera, Graphic Designer
Nancy Petkunas, Marketing Specialist

GLOBAL PRODUCT SUPPORT CENTER

Nancy Parquette, Corporate Programs and Events Manager

ADVERTISING OPERATIONS

Karen Lincoln, Senior Director of Advertising Operations
Maro Eremyan, Advertising Coordinator
Jami Thompson, Advertising Coordinator
Veronica Trotto, Direct Response Ad Coordinator
Cheryl Hill, Traffic Coordinator

PRODUCTION

Ann Finn, Senior Production Director
Greg Morgan, Production Manager
Mike Guerin, Senior Print Buying Supervisor

CIRCULATION

Richard Priante, Senior Director of Circulation
Darcy Beach, Circulation Operations Manager
Bobbie Cruse, Subscriptions Manager
Mary McIntire, Senior Marketing Specialist

RESEARCH

Ann MacKay, Research Director

DISTRIBUTION

Bob Wescott, Distribution Manager/(508)879-0700

IDG LIST RENTAL SERVICES

Paul Capone, Account Executive
P.O. Box 9151, Framingham, MA 01701-9151
(800) 343-6474/(508) 370-0825, FAX:(508) 370-0020

SEMINARS AND EVENTS

Robin Azar, Vice President of Events
Michele Zarella, Director, Events Business Development
Sandra Gittlen, Community Events Editor
Betty Amaro, Event Finance Manager
Andrea D'Amato, Sales Director/Strategic Partnerships
Kristin Ballou, Senior Event Sales Manager
Lisa McLaughlin, Event Sales Manager
Sandy Weill, Event Sales Manager
Debra Becker, Dir., Marketing & Audience Development
Jennifer Golden, Marketing Specialist
Tricia Fiscale, Sales and Marketing Coordinator
Kevin Gilligan, Director, Events Operations
Jill Keaveney, Senior Event Planner
Tim DeMeo, Event Coordinator
Andrea Fusco, Registration Manager
Timothy Johnson, Fulfillment Service Coordinator

ONLINE SERVICES

Alonna Doucette, V.P., Online Services
Hillary Freeley, Director, Online Audience Development
Charley Spektor, Director, Business Development
Adam Gaffin, Executive Editor, Online
Melissa Shaw, Managing Editor, Online
Jason Meserve, Multimedia Editor
Sheryl Hodge, Online Copy Chief
Marlo Matoska, Senior Web Producer
Katherine Ward, Web Producer
Christopher Cormier, Web Producer
Kris Guay, Associate Web Producer
Elaine Valovic, Web Researcher

INFORMATION SYSTEMS/NEW MEDIA SERVICES

Michael Draper, V. P. Systems & Technology
Tom Kroon, Senior Software Engineer/Architect
Bob Roddy, Web Software Engineer
William Zhang, Senior Software Engineer
Rocco Bortone, Senior Network Manager
Peter Hebenstreit, Network Specialist
Kevin D'Keefe, Systems Support Manager
Brian Wood, Senior Systems Support Specialist
Joshua Mason, Systems Support Specialist
Puneet Narang, Manager of Database Technologies
Pam Gertsios, Database Specialist
Anne Nickinello, Director of New Media Services
Deborah Vozikis, New Media Design Manager
Sean Landry, Web Producer
Michael Ferreira, Graphics Production Coordinator

IDG

Patrick J. McGovern, Chairman of the Board
Kelly Conlin, CEO

Network World is a publication of IDG, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. IDG publishes over 275 computer publications in 75 countries. Ninety million people read one or more IDG publications each month. *Network World* contributes to the IDG News Service, offering the latest on domestic and international computer news.

NetworkWorld seminars and events

Network World Seminars and Events are one and two-day, intensive seminars in cities nationwide covering the latest networking technologies. All of our seminars are also available for customized on-site training. For complete and immediate information on our current seminar offerings, call a seminar representative at 800-643-4668, or go to www.nwfusion.com/seminars.

NetworkWorld

EDITORIAL INDEX

A	Infonet	27	Radiant Logic	33
Agilera	intel	14,16	RedCreek	14
Aprisma	Interliant	27	RedSiren	14
Asita	Internet Security System	16	RLX Technologies	18
AT&T	L		S	
B	LinkSys	47	SerCoNet	24
BMC Software	M		Siebel Systems	13
Broadwing	McAfee	33	SOHOware	47
C	Microsoft	8	SonicWall	14
Cable & Wireless	N		Sprint	27,70
Check Point Software	NEC America	41	Sun	8,19
Cisco	NetIQ	22	Sycamore Networks	14
Comcast	Network Appliance	19	Sygate	47
Compaq	Network Ice	14	Symantec	47
Computer Associates	Nishan	14	T	
Concord Communications	Nortel Networks	8,13	Telestream	49
E	Novell	19	Time Warner	23
EarthLink	O		Time Warner Telecom	27
EMC	OneSecure	10	Tivoli Systems	1
Epiphany	P		U	
Equant	PacketLight Networks	29	U.S. Robotics	23
Exodus	PeopleSoft	13	V	
F	Pilot Network Services	8	Verizon	23
FiberLink	Pretty Good Privacy	47	Vixel	19
Foundry Networks	PrismTech	29	W	
H	ProactiveNet	16	Watchfire	33
Hewlett-Packard	Proxim	23	WaveSmith Networks	29
Huawei Technologies	Q		X	
I	QuantumShift	41	XO Communications	1
i2 Technologies	Quick Eagle Networks	29	Z	
IBM	Qwest Communications	1	Zama Networks	41
IBM Global Services	R		ZoneAlarm	47

ADVERTISER INDEX

Advertiser	Page #	URL	Sunrise Telecom	52	www.sunrisetelecom.com
AT & T	32	www.att.com	Ubizen	56	www.ubizen.com
Avaya	6	www.avaya.com	Unisys Corp	24	www.aheadforebusiness.com
Avaya	22	www.burlgrp.com	Unisys Corp	25	www.unisys.com
Bay Technical Association	54	www.baytech.com	World Data Products	59	www.wdpci.com
Broadwing Inc	26	www.broadwing.com			
Canon USA Inc	20-21	www.imagerunner.com			
Computer Associates	4	www.ca.com			
Digital Network	11	www.digitalnetworks.net			
Extreme Networks	72	www.extremenetworks.com			
Global Technology Associates Inc	58	www.gnatbox.com			
Hergo Ergonomic Supplies	56	www.hergo.com			
IBM	2-3, 15, 17, 36-37	www.ibm.com			
Intel Corp	9	www.intel.com			
Micromuse Inc	55	www.micromuse.com			
Mier Communications	34	www.mier.com			
Net Optics Inc	57	www.netoptics.com			
NetCalibrate	56	www.netcalibrate.com			
Network Instruments	53	www.networkinstruments.com			
Network Technologies	59	www.nti1.com			
PC Expo	38	www.techxny.com			
Quick Eagle	28	www.quickeagle.com			
Rackit Technology Corp	59	www.RackitTechnology.com			
Riverstone Networks	31	www.riverstonenet.com			
Rose Electronics	53	www.rosel.com			
Server Technology	54	www.servertech.com			
Sharkrack	58	www.sharkrack.com			
Siemens ICN	71	www.freevoipfromsiemens.com			
SonicWALL	13	www.sonicwall.com			

Sunrise Telecom	52	www.sunrisetelecom.com
Ubizen	56	www.ubizen.com
Unisys Corp	24	www.aheadforebusiness.com
Unisys Corp	25	www.unisys.com
World Data Products	59	www.wdpci.com

Network World Fusion - www.nwfusion.com

3 Com	Network Technologies, Inc
BitPipe	Opticom, Inc
BMC Software	Oracle
Broadwing	Oresis
Brocade	PKWare, Inc
CheckPoint Software Technologies	Quintum Technologies
Cisco Systems	Radware
Computer Associates International	Shomiti Systems
F5 Networks	Siemens
FirstWorld	Stalker Software
Foundry Networks Inc	Sygate Technologies, Inc
Hewlett Packard	Verilink
IBM	VenSign
Intel	Veritas
Mangosoft, Inc	WaveSmith Networks
McData Corp.	Zuma Networks
Network Associates	

These indexes are provided as a reader service. Although every effort has been made to make them as complete as possible, the publisher does not assume liability for errors or omissions.

*Indicates Regional/Demographic

Sales Offices

Carol Lasker, Associate Publisher/Vice President
Debbie Lovell, National Sales Operations Manager
Internet: clasker, dlovell@nww.com
(508) 460-3333/FAX: (508) 460-1237

NEW YORK/NEW JERSEY

Tom Davis, Associate Publisher, Eastern Region
Elisa Della Rocco, Senior District Manager
Terry Sanders, Account Executive
Aimee Jacobs, Sales Assistant
Internet: tdavis, elisas, tsanders, ajacobs@nww.com
(201) 587-0090/FAX: (201) 712-9786

NORTHEAST

Donna Pomponi, Regional Sales Manager
Kathryn Zinn, District Manager
John Mahoney, Account Executive
Caitlin Horgan, Sales Assistant
Internet: dpomponi, kzinn, jmahoney, chorgan@nww.com
(508) 460-3333/FAX: (508) 460-1237

MID-ATLANTIC

Jacqui DiBianca, Regional Sales Manager
Internet: jdibian@nww.com
(610) 971-1530/FAX: (610) 975-0837

MIDWEST/MARYLAND

Eric Danetz, Senior District Manager
Aimee Jacobs, Sales Assistant
Internet: edanetz, ajacobs@nww.com
(201) 587-0090/FAX: (201) 712-9786

CENTRAL

Dan Gentile, Midwest Regional Director
Gracie Vela, Sales Assistant
Internet: dgentile, gvela@nww.com
(512) 249-2200/FAX: (512) 249-2202

NORTHERN CALIFORNIA

Sandra Kupiec, Associate Publisher, Western Region
Miles Dennison, Regional Sales Manager
Lara Greenberg, Senior District Manager
Sean Weglage, District Manager
Carmella Baglione, Account Executive
Tina Barnes, Sales Operations Manager
Grant Turner, Sales Assistant
Anjenette Pike, Sales Assistant
Internet: skupiec, mdennison, lgreenberg, sweglage, tbarnes, cbaglione, gturner, apike@nww.com
(650) 577-2700/FAX: (650) 341-6183

NORTHWEST/ROCKIES

Carol Stiglic, Regional Sales Manager
Karen Weiss, Regional Sales Manager
Internet: cstiglic, kweiss@nww.com
(650) 577-2700/FAX: (650) 341-6183

SOUTHWEST

Becky Bogart Randell, District Manager
Angela Perna, Sales Assistant
Internet: brandell, aperna@nww.com
(949) 250-3006/FAX: (949) 833-2857

SOUTHEAST

Don Seay, Regional Sales Manager
David Mooney, Sales Assistant
Internet: dseay, dmooney@nww.com
(404) 845-2887/FAX: (404) 250-1646

CUSTOM PUBLISHING

Shaun Budka, Custom Media Solutions Manager
Internet: sbudka@nww.com
(508) 460-3333/FAX: (508) 460-1237

FUSION

James Kalbach, Sales Manager
Jeff Schwartz, Online Account Manager
Robert Koenig, Online Account Manager
Stephanie Gutierrez, Online Account Manager
Debbie Lovell, Account Executive
Kristin Baker, Operations Manager
Internet: jkalbach, jmschwartz, rkoenig, sgutierrez, dlovell, kbaker@nww.com
(610) 341-6025/FAX: (610) 971-0557

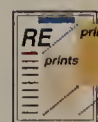


DIRECT RESPONSE ADVERTISING Response Card Decks/Marketplace

Richard Black, Director of Direct Response
Karima Zannotti, Account Manager
Enku Gubaie, Senior Account Manager
Cara Peters, Account Manager
Amie Gaston, Account Manager
Sharon Stearns, Sr. Media Dev. & Operations Mgr.
Chris Gibney, Sales Operations Coordinator
Internet: rblack, kzannott, egubaie, cpeters, agaston, sstearns, cgibney@nww.com
(508) 460-3333/FAX: (508) 460-1192

IT CAREERS

VP/General Manager, Janis Crowley, East Regional Manager,
Deanne Holzer, Eastern Account Manager, Chantelle Finney, Midwest
Regional Manager, Laura Wilkinson, Western Regional Manager,
Donna Dugo, Western Account Manager, Whitney Nagy, Marketing
Director, Kelli Flanagan, Operations Manager, Donna Kent, Advertising
Coordinator, Leilani Lopez, Advertising Coordinator, Carla Amaral,
Marketing Specialist, Heidi Tanakatsubo, Eastern Sales Associate,
Tina Silveira, Midwest Sales Associate, Nikki Wilson, West Coast Sales
Associate, Lisa Olivas, Marketing Coordinator, Claudia Tsunoda,
Maureen Clarke, Midwest Account Manager
(800) 762-2977/FAX: (650) 286-2770



Publicize your press coverage in *Network World* by ordering reprints of your editorial mentions. Reprints make great marketing materials and are available in quantities of 500 and up. To order, contact Reprint Management Services at Greenfield Corporate Center 1811 Olde Homestead Lane, Lancaster, PA 17601 (717) 399-1900 fax (717) 399-8900. E-mail: rtty@rmsreprints.com

IBM,
continued from page 1

between firms, says Randy Mowen, director of data management and e-business architecture for Bekins, a moving and storage company based in Hillside, Ill. His firm plans to implement IBM's Web services.

"In the past, [business-to-business] has been application program-centric," meaning businesses weren't really collaborating unless it was with partners on a regular basis, Mowen says. The moving company is also interested in adding an automatic billing-payment process, which could be built fairly quickly through Web services, he adds.

Mowen says there are technology and business complications, such as who should have access to what Web services and how to technically implement these security measures.

"Web services transcend the operating system, platforms and applications, and . . . a whole bunch of headaches [such as testing and integrating products] just went away," says Peter O'Kelly, an analyst at Patricia Seybold Group. Companies wouldn't need to spend hours testing products that are supposed to work together, and integration issues — which include costs that may reach \$1 million — go away because products won't need a special interface, other than XML, to communicate with

Web services: the new frontier for e-business

The following are some of IBM's Web services competitors:

Company	Product
Microsoft	.Net includes development tools, server software and devices that run applications locally or at the server, and can be hooked into other applications.
Sun	Open Net Environment (ONE) consists of server software, development tools and other products to build Web-based e-commerce applications and services.
Bowstreet	Business Web Factory allows members to view an inventory of available services, study background information and negotiate a contract with service providers.

each other.

Web services depend heavily on four central standards: XML; Simple Object Access Protocol (SOAP); Universal Description, Discovery and Integration (UDDI); and Web Services Description Language (WSDL), analysts say. UDDI is intended to provide a way for companies engaged in e-business to discover the kinds of e-business that others are doing, and what protocols they use for transactions and communications. WSDL attempts to standardize how a service and its provider are described. SOAP transports XML-formatted messages from one business application to another over the Internet.

IBM will deliver support for those standards across its product line. New products being announced this week include:

- WebSphere Studio Technology Preview for Web services, a Java application tool that will let businesses convert their Java applications into XML-based technology, such as SOAP. The tool will also let businesses publish these converted applications on an UDDI registry. It will be generally available in September.

- Tivoli Web Services Manager monitors the performance of an entire chain of Web services transactions, for example, watching out for bottlenecks. It will be available in June.

On June 30, IBM will release a new version of its flagship platform WebSphere Application Server with support for UDDI, SOAP, WSDL and Java 2 Enterprise Edition (J2EE). Through these standards, WebSphere 4.0 would be the backbone of Web services, connecting with business applications such as SAP

R/3 and PeopleSoft, as well as with a public UDDI registry.

IBM recently released DB2 7.2 with SOAP and UDDI support, letting Web services applications access data stored in DB2 or any other UDDI-based database. IBM's Tivoli arm offers Manager for WebSphere Application Server, which lets businesses manage distributed environments that use WebSphere to host Web services applications, and SecureWay Policy Directory, which will let businesses build security into their Web services applications.

Lotus also offers Web services capabilities in its Domino Application Server, Domino Workflow, Sametime and LearningSpace.

NextWine.com's Dain Dunston says the wine broker will need Lotus-based Web services as it grows.

"Right now we're a fairly small company, but we would certainly want to access the functionality of Domino and Notes," says Dunston, who is president and founder of the Napa Valley, Calif., firm. Rather than installing, integrating and testing the applications themselves, NextWine.com could use a "network-based" version of Domino and Notes.

Although analysts and customers are bullish over the potential of Web services, most believe such Web services won't hit the mainstream until 2003.

"No Global 100 company is going to raise their hand now [with the current economy], say they buy into this and will throw \$100 million, \$50 million toward Web service-based architecture," says Evan Quinn, an analyst at Hurwitz Group. ■

Get more information online.
DocFinder: 4253

www.nwfusion.com

GERSTNER PARRIES TALK HE MAY EXIT

The future of the IT industry is in services and consulting, but never mind the Big Five — the real services leader is Big Blue, IBM CEO Lou Gerstner said last week during his annual meeting with Wall Street analysts.

IBM's focus on services was a central theme of Gerstner's remarks. "Four years ago we bet the company on e-business," he said. "E-business is for real, and it will prescribe customer IT spending for the next decade. You are headed for commoditization hell if you don't have services."

Several analysts predicted that this meeting could be Gerstner's swan song. His contract with IBM expires next March, and the 59-year-old executive is not expected to renew. Company President Sam Palmisano has been Gerstner's heir apparent since he was promoted to COO in July 2000.

Gerstner defused those rumors with a reference to Mark Twain's famous line about greatly exaggerated death reports. He deflected questions about whether he'll be attending next year's analyst meeting, quipping that IBM "doesn't plan that far in advance."

IBM's services focus will usher in a new Golden Age for the company akin to the one it enjoyed in the 1960s and 1970s when it ruled the then-dominant mainframe market, Gerstner said. He also cited several examples of IBM's internal heeding of its e-business mantra. The company "e-procured" 94% of everything it purchased last year, saving \$375 million, Gerstner said. Online employee education saved another \$350 million.

Gerstner took swipes at several IBM rivals in his speech, noting corporate investment in hardware and software grew 11.3% in the U.S. in the first quarter of 2001. The only firms having trouble with sales and growth, Gerstner hinted, are those that "were accomplices in this New Economy mumbo jumbo."

"I never fail to be amazed by the binary, in or out, feast or famine mentality in this industry. You know the pattern: mainframes rule, then mainframes are dinosaurs. PCs are king, PCs are dodo birds," Gerstner said.

"Most recently, December was 'like somebody turned out the lights.' And now there is a '100-year flood' in this industry," Gerstner said, riffing on Cisco Chief John Chambers' recent metaphor for the downturn. He dismissed such comments as hand waving, firing back, "There's no blackout and there's certainly no washout. What's really going on here is that a bubble has burst. The dot-com bubble has burst."

— Stacy Cowley

Cowley is with the IDG News Services' New York bureau.

Network World, 118 Turnpike Road, Southborough, MA 01772-9108, (508) 460-3333.

Periodicals postage paid at Southborough, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385662. Network World (ISSN 0887-7661) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 118 Turnpike Road, Southborough, MA 01772-9108.

Network World is distributed free of charge in the U.S. to qualified management or professionals.

To apply for a free subscription, complete and sign the qualification card in this issue or write Network World at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on the information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-490-6444.

Nonqualified subscribers: \$5.00 a copy; U.S. - \$129 a year (except Washington, DC, \$136.74); Canada - \$160.50 (including 7% GST, GST#126659952); Central & South America - \$150 a year (surface mail); Europe - \$205 a year (surface mail), all other countries - \$300 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

Please include mailing label from front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106.

PHOTOCOPYRIGHTS: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by Network World, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus 50 cents per page is paid to Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970.

POSTMASTER: Send Change of Address to Network World, P.O. Box 3090, Northbrook, IL 60065.



Copyright 2001 by Network World, Inc. All rights reserved. Reproduction of material appearing in Network World is forbidden without written permission.

Reprints (minimum 500 copies) and permission to reprint may be purchased from Reprint Management Services, Greenfield Corporate Center, 1811 Olde Homestead Lane, Lancaster, PA 17601, (717) 399-1900 ext. 124, rtry@rmsreprints.com.

USPS735-730

Interop,
continued from page 1

before you buy."

The cost-cutting theme was evident even in the event's attendance, which show organizers estimated at 15% below last year's crowd of 60,000 — probably the result of cuts in corporate travel budgets.

Service providers were active at the show, with the hopes that an economic slide will attract users to outsourcing applications or cheaper alternatives to traditional WAN services such as T-1 and T-3 lines.

"Customers are more concerned about total cost of ownership," said Jeremy Thompson, president of Cable & Wireless a-Services ASP business, which hosts Microsoft Office and Exchange applications for customers. "Outsourcing is less expensive and offers users more flexibility."

"When things were going well and users were having record profits, they were willing to stay where they were," said Richard Ellenberger, CEO at Broadwing, a carrier that introduced a Gigabit Ethernet WAN service at the show.

"Now they are being told: 'Either you will have to cut 10% of your group or you'll have to find a new approach to telecom,'" he said.

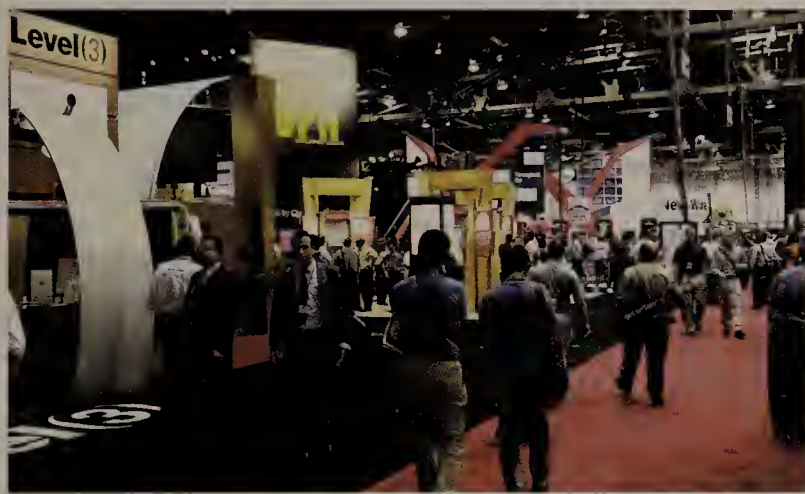
Broadwing claims new dedicated wavelength services could deliver companies up to 2.4G bit/sec at 20% less cost than similar SONET services.

"We have Fortune 1000 companies that are saying 'I want to talk to you about lightwaves, I want to talk about a different approach that can cut my costs,'" Ellenberger said.

NetReality, a maker of traffic monitoring and shaping devices, used Interop to informally survey IT managers about their budgets.

Of the 334 attendees interviewed, 84% said they have experienced some sort of budget cut this year. Half of those interviewed said their budget cuts were in the 20% to 40% range.

Hardware vendors at the show were ready to answer the call for austerity. For example, the exorbitant costs of electricity and data center space are the twin targets of Compaq's new hyperdense QuickBlade servers, which will feature Intel's low-voltage Tualatin processors (see related story, page 18).



Crowds were down at this year's NetWorld+Interop conference in Las Vegas, and those who attended were looking for ways to save money.

"This innovative design will let you put hundreds of servers where today 40 or so is the best we can do," said Compaq CEO Michael Capellas in a videotaped message at the show's opening keynote session. "QuickBlade will not only use a fraction of the normal

power consumption, it will also be the answer to the high cost of data-center real estate. And it will define a new server metric by which you will judge us: transactions per watt, per square foot of data-center space."

Other hardware vendors

echoed the "try before you buy" mentality of Aurora Health Care's Kloskey. To help large organizations that want to deploy IP voice, Empirix is targeting its line of PacketSphere test systems at large enterprise network test labs. While used mainly by voice-over-IP equipment makers and service providers, Empirix said companies can make better buying decisions on what types of voice-over-IP gear or network upgrades are necessary for IP telephony by running a network though the paces.

Of course, not everyone at the show — located in the heart of a city that encourages its visitors to spend wildly in its casinos — was feeling the economic pinch in their IT budgets.

"We budget and purchase IT products based on what we need, not based on the econ-

omy," said Mike Meyers, network architect for Health Midwest, a nonprofit healthcare organization in Kansas City, Mo. "It's simple — either you need these computers or you don't. If we need them, we buy them."

Meyers said that while net management is important, many show vendors overused the struggling stock market example to try to scare users into thinking they need new management products to keep network costs down.

Staff Writers Phil Hochmuth and Denise Dubie, Senior Editor Denise Papalardo and Associate News Editor Paul McNamara contributed to this report.

Get more information online.
DocFinder: 4254

www.nwfusion.com

Giga,
continued from page 1

that many providers are letting customers pay only for bandwidth they consume, rather than a flat monthly fee. For instance, a provider might deliver a 1G bit/sec port to a customer site, but the customer would only be charged for the average bandwidth used, even if traffic burst to 1G bit/sec at certain times.

"Once you can do voice over Ethernet reliably, companies can start migrating voice from their T-1s and T-3s," said Nick Maynard, an analyst with The Yankee Group.

Competition from metropolitan and long-haul Ethernet services should drive down T-1 pricing, too, though Maynard said there is a catch: "You're basically going to have to be in the downtown of a major metropolitan area to get this stuff."

Qwest goes Gigabit

Qwest's Ethernet services, ranging from 2M to 1G bit/sec, will be billed per gigabit transferred.

Qwest's Dedicated Internet Access service will initially be available in seven markets (see graphic), with more to be added in the second half of the year.

Customers will not be required to install new equipment, said Rick Weston, a senior vice president with Qwest. The carrier will link to customers using Cisco ONS15454 multi-

plexers that tie into fiber rings provided by Telseon, a metropolitan-area Gigabit Ethernet provider selling wholesale and retail access.

Competitive providers such as Telseon, as well as Yipes, Cogent and XO, have been serving up MAN Ethernet services for some time (Yipes also pro-

vides long-haul connections). And independent local exchange carriers (ILEC) such as Verizon have begun limited rollouts.

West last year and provides local services in 14 Western and Midwestern states.

"They'll be offering services just like any other competitive carrier," Maynard said. "It could put them in competition with someone like Yipes. But in most cases, I suspect they'll be taking business from other [regional



vides long-haul connections). And independent local exchange carriers (ILEC) such as Verizon have begun limited rollouts.

What separates Qwest from the other ILECs in the Gigabit Ethernet market is that the company is building or leasing fiber rings in 25 out-of-region cities. All of the initial Ethernet markets are out-of-region for Qwest, which purchased U.S.

Bell operating companies]."

While Qwest may be coming to market later than other players, Weston said the company can differentiate itself by offering a full portfolio of services — not just bandwidth.

"We can serve up data, voice, storage-area networking, pretty much any service a company would want," he said. "We believe that will give us an edge."

However, others do sell more than access services. For instance, Yipes offers Web hosting and other services.

Qwest will be among the few carriers delivering Gigabit Ethernet over a national network.

Joining Qwest, though, will be XO, which has been providing Ethernet, Fast Ethernet and Gigabit Ethernet services over its metropolitan networks since late last year. The company plans to launch a national Ethernet service by June, said John Curran, an XO vice president.

And as expected, Broadwing announced its first long-haul Gigabit Ethernet service trial with two customers it would not identify (www.nwfusion.com, DocFinder: 4153). Broadwing has a national fiber-optic network, but has not built its own local or metropolitan-area networks and said it will team with multiple providers to offer users end-to-end Gigabit Ethernet services.

Yipes also offers long-haul Ethernet connections.

Missing from the action so far are AT&T, WorldCom and Sprint, though Sprint said it will support Gigabit Ethernet in its MANs as it builds them and is investigating the technology for its long-haul network. ■

Get more information online.
DocFinder: 4255

www.nwfusion.com

It was Outlook's fault . . .

Two Fridays ago a colleague said, "See you at the meeting Monday."

"What meeting?" I replied.

He cracked up, "Thank God I'm not the only one with Alzheimer's — you accepted the Outlook meeting request." "I did?" "You did . . . yesterday." This was the first event that led to the worst day I've had this year.

As soon as I got a chance, I checked out how this faux pas could have occurred. Ah-ha! Outlook was set to automatically accept meeting requests, but it doesn't warn you when it does. Another Outlook feature revealed.

So now I was committed to a meeting on the morning I was to drive from my home (north of Los Angeles) to Las Vegas for the spring NetWorld+Interop 2001 (roughly a five-hour road trip).

This meant I'd have to drive to our office Monday morning, attend the meeting and then leave for Las Vegas at, at best, 1 p.m. Not bad, but not what I'd planned.

Later that Friday my wife called me from home and said, "Why doesn't the printer work?" When I got home, I checked

the printer and assumed it needed new ink cartridges. Since I wouldn't have a chance to get new cartridges over the weekend, I figured I'd print out my route map to Vegas at the Monday morning meeting.

Monday morning came and I found I couldn't get access to a printer at the office, so what to do? I realized I had forgotten my cufflinks so I thought, "Why not go home, pick up ink cartridges on the way and then print my maps at home. I could then grab my cufflinks and head out for Vegas."

I stopped at CompUSA to get new ink cartridges and a power adapter so I could use my PC with my new Garmin eMap GPS to navigate as I drove.

But when I changed the cartridges, the printer still didn't work. I downloaded and installed the diagnostics that I hadn't installed when I set up the server originally. Ah-ha! The problem was a print head had died. But the diag-

nostics didn't tell me which one.

Now what? Well, why not just rely on the computer instead of printing out maps? I had De Lorme's Road Warrior Edition of Street Atlas. With GPS support this product can announce the turns in a route by voice synthesis as well as respond to spoken commands (Me: "Where am I?" Computer: "Lost."). This would be cool. (Note that by now, it was 3 o'clock, and I'd planned to leave at 1. My plans were not looking good.)

So I plugged an adapter into the car and discovered it didn't come with the correct plug for my laptop. But I had some other adapters, and I finally found one that fit.

I carefully set the polarity (the adapter instructions warned about getting the polarity wrong) and plugged in the laptop. It immediately froze. Oh no. The polarity must be wrong. I powered the computer down, reversed the polarity, plugged it in and restarted the machine.

Instantly there was the smell of fried electronics. The laptop was dead. I have no idea why the machine froze the first time, but the polarity — until I changed it — had, in fact, been right. Aghhhhh!

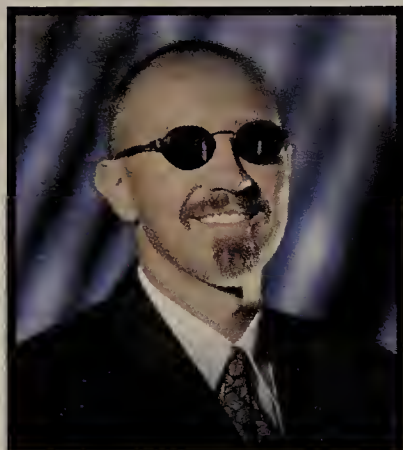
This was a disaster. Of course I didn't have a current backup and my life was on that machine. OK, hang tough (as opposed to breaking into uncontrolled sobbing). I drove back to CompUSA (they are the nearest repair service I have), checked the dead machine in and went to buy print heads.

Of course, they had three of the four heads required. I tried a couple of other shops without any joy and returned home hoping that I'd strike lucky with the three new heads. This was my first break — the printer worked!

I printed out route maps from another machine using MapBlast (www.mapblast.com) and finally left just before 7 p.m.

I arrived in Las Vegas around midnight with my old Sony C1 laptop to write this, but without my schedule, telephone list or e-mail system. What a week, and it was only just edging into Tuesday.

So how was your week? Get sympathy at nwcolumn@gibbs.com.



MARK
GIBBS



The latest on the
Internet industry

Sprint's Frank Denap will look you in the eye and insist his company's Digitally Enhanced Network Appliance Project is going to rewrite the conventions of telecommuting.

So what, you say? Aren't vendors always touting the revolutionary powers of their creations?

Well, Denap is talking about a robot — a droid, by his description. Think R2-D2 or that whiney bucket of bolts that tormented Dr. Smith on "Lost in Space." The three of us — Denap, Buzz and a crude prototype of the droid — spoke last week on the show floor at NetWorld+Interop 2001.

Denap sounds like a level-headed, well-informed earthling when he talks about the "isolating" effects of working from home and how they can make the growing practice unrewarding — if not untenable — for telecommuter and employer. The problem is real, all right.

"We want to put more reality into the virtual world," Denap says.

But robots? . . . Why don't we just have Scotty beam our teleworkers into the office for a dose of human bonding every now and then?

Denap knows people are looking at him like he has two heads, but he remains undeterred.

His droids — wireless videoconferencing units on wheels — will not sit at the sides of their teleworker partners, but rather represent them back at the office; robotic surrogates, if you will. Should the human half need to chat with the boss or a cubicle-bound co-worker, he will eschew the stifling options of telephone and e-mail in favor of asking his droid to wheel over to the target. A real-time video chat ensues.

Unless the droid first happens to encounter a familiar face in the hallway — human or otherwise — in which case it/they will commence kibitzing. Already our teleworker is happier because he's able to waste time gabbing at the water cooler just like his colleagues who commute by car.

You can have fun thinking about this concept even if you believe it's nuttier than a UFO convention. Just don't get your heart set on being issued a droid any time soon.

You'll have to wait a few years for Sprint to bring them to market.

Then you'll have to wait a few more for your boss to take leave of his senses.

With so much convention talk centering on the drive to get more Internet users devoting more time and more money to ever-richer Web applications, there was an irony in the unapologetic presence of a class of vendor some might see as the movement's antithesis. The makers of Web use monitoring and filtering tools were well represented, if not exactly in tune with the show's guiding theme of more is better.

With cutesy-pie names such as St. Bernard Software, Webwasher.com and 8e6 Technologies, they're all selling the same commodity: fear . . . fear that your employees are ripping off the company by surfing when they should be working, and fear that "inappropriate use" will somehow get the company sued.

What party poopers.

You may have read his reviews in *Network World*, but you haven't seen anything until you've seen Joel Snyder live and in concert.

Imagine if Robin Williams was an expert on the inner workings of VPNs: That's what you get from Snyder as he headlines VPN Day at N+I.

You get manic, nonstop, rapid-fire, arms-akimbo stomping back and forth. You get expertise, yes, but more important, you get uncommon candor. Witness: "As much as I respect the largest software company in the world, I think their whole L2TP [standard] thing is really stupid," and, "Most ISPs are morons."

By the afternoon session, Snyder had an auditorium full of hard-core network professionals chanting the last one on cue.

Every Vegas show should be this entertaining.

Candor is always welcome here. The address is buzz@buzz.com



PAUL
MCNAMARA

SIEMENS

Make your business mobile with IP solutions for the convergence of voice and data networks.

Wants to be an architect.

Wants to take over daddy's company.

Wants to change the world.

Envision your own future. HiPath takes you there.

You're investing a small fortune integrating e-commerce into your core business processes and technologies. You need an e-CRM solution. You have mobile employees who work remotely. And on the horizon shines the future of converged networks, with easier integration, user access and management.

You need a technology investment strategy. One that lets you build advanced solutions today for the **Next Generation Internet** and evolve to a converged network without losing valuable time or money. You need HiPath™, Siemens Enterprise Convergence Architecture. Be it conventional, IP or hybrid networks. Network neutral applications. All the services you need to realize your vision. HiPath, from **Siemens Information and Communication Networks** handles it all. Learn about a beautiful future, and a limited time offer for free VoIP. Catch the details now at www.freevoipfromsiemens.com/nw.

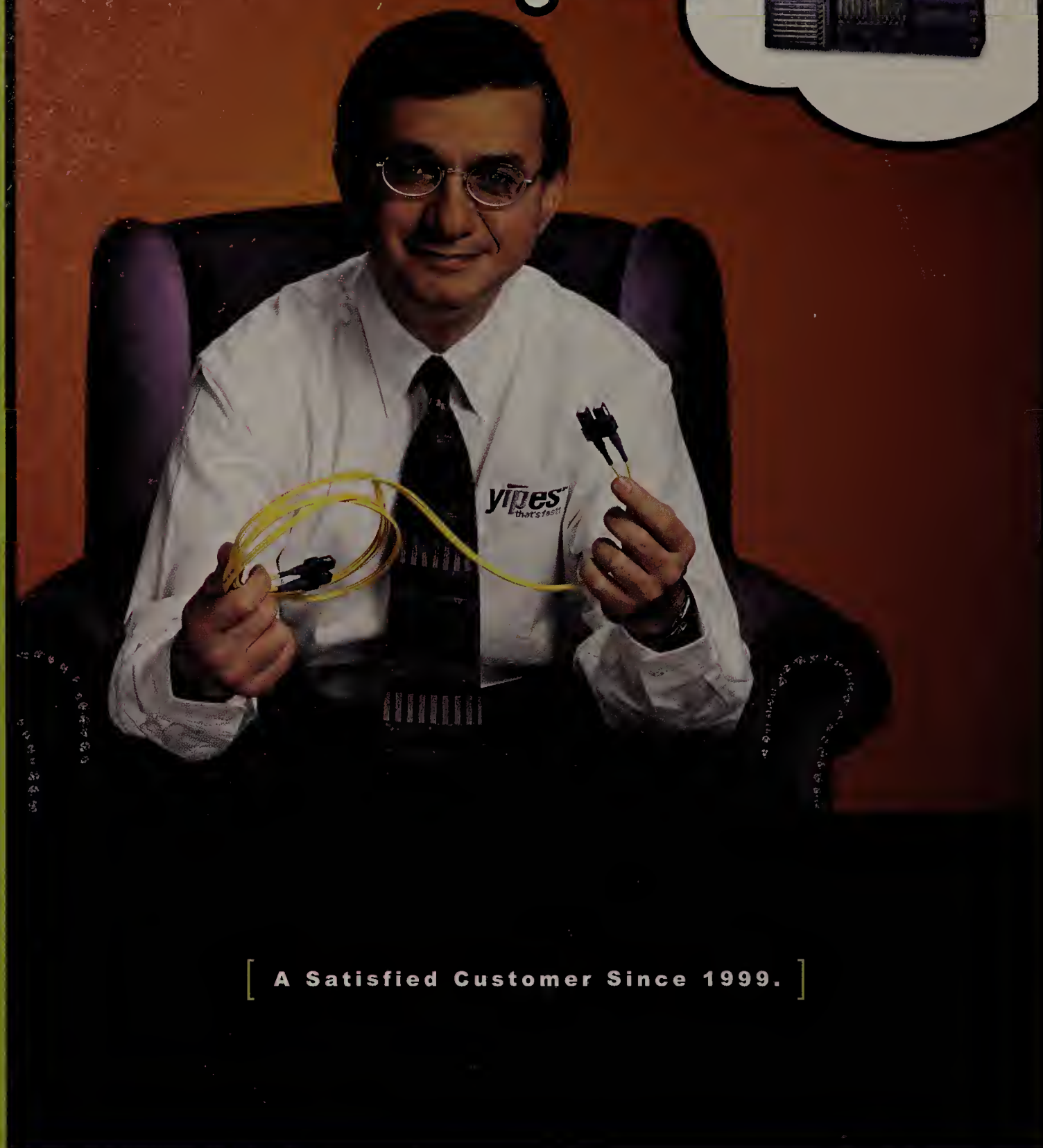
mobile business

Free VoIP
Limited Time Offer.

Call 1-888-333-5567, or go to
www.freevoipfromsiemens.com/nw

*For complete terms and conditions, as well as other special offers on IP solutions, see our website at www.freevoipfromsiemens.com/nw, or call 1-888-333-5567. Must take delivery by September 30, 2001.

Dr. Kamran Sistanizadeh,
Chief Technology Officer,
Yipes Communications, Inc.



[A Satisfied Customer Since 1999.]

If the look on the CTO's face is any indication, Yipes Communications, Inc. is one happy camper. Yipes — the defining provider of Ethernet-based metropolitan optical networks for IP services — is offering businesses in over 20 major U.S. cities a fast, scalable and extremely affordable alternative to ATM and SONET. Because of Extreme Networks' Alpine™, BlackDiamond® and Summit® switches, Yipes can provision its customers with bandwidth on demand — from 1 Mbps to 1 Gbps — over the same strand of fiber. A powerful networking solution that's a dream come true — for everyone except the competition.



Ethernet Everywhere™